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Safety in Theatres and Places of Public Amusement.

MUCH has been done of late by the lessees and owners of London places of amusement to secure the safety and comfort of the public. New theatres and halls have risen to take the place of dangerous structures; old theatres have been rebuilt and remodelled; thousands of pounds have been spent by our managers to meet the requisitions of the late Board of Works and the London County Council; houses and lands adjoining their premises, mostly in our busiest thoroughfares, have been purchased at great outlay; staircases have been widened, and additional exits provided to benefit a public knowing little or nothing of all that has been done for their security.

Not only have structural alterations been executed under the Metropolis Management and Building Act Amendment Act, but other important changes have been carried on voluntarily by the lessees. The advance of science has brought a valuable aid to them in the form of the electric light, which has been installed in many theatres and halls at considerable outlay. In some cases "power" has had to be specially provided, and the scenery repainted to adapt it to the varied quality of the new light. The installation of the new fittings, both to auditorium and stage, and the extra nightly cost over and above that of gas, have all been additional expenses borne by lessees for the good of the public.

Where electric light is used, we can now go to a theatre without experiencing a feeling of suffocation; the risk of getting overheated, and catching cold after by going into the night air, is avoided. Even a much more important object than this is attained—the reduction of fire risk. The old gas system was and is a bad one in every way. The proximity of gas, too often unprotected, to inflammable material, and the escape from the joints of the temporary pipes which connect up the border and ground rows, are dangers that occur in the best supervised theatres. Where the electric light is used all this danger is avoided.

In dealing with places of public amusement, one must ever bear in mind that one great object is to prevent panic; in order to do this avoid fire risk, narrow passages, winding staircases, insufficient exits, crowded seating, and an unsuitable site. Theatres, and all public buildings of this class, should be entirely fire-resisting, having nothing in their construction that will readily ignite; by this means the ordinary methods of fire extinction, along with strict supervision and adequate appliances, will be found sufficient for the protection of the building. By giving careful consideration to the planning and disposition of the various parts, and judicious choice of the materials for construction, a theatre can, in spite of its being such a heavy fire risk, be made as safe as any other building, and the business of the house can be carried on with perfect security to both life and property.

The first thing, however, for the architect to learn is, what is wanted in a theatre, and how a house should be arranged in every detail; until this is ascertained it is useless to try and plan a "safe" theatre. It is a *sine quâ non* that there must be a place for everything, and everything in its place; it is necessary to know what this everything is before the place for it can be provided, and it is only by becoming thoroughly acquainted with the *modus operandi* of "show" business that provision can be made to minimise and avoid the risks that follow.

The first point is to provide, in planning a house, that the audience and staff should be able to get out of the building in the shortest possible time, at the slightest warning. Avoid all risks of panic. Panic has more victims than fire. Many deaths occur where there is not a spark of fire in the building, and literally no danger whatever, this being in most cases due entirely to an ill-constructed and badly-planned house, unfit for the reception of numbers of people. Create confidence in the audience, and half the battle is won; show to them their safety is in their own hands, and that everything possible has been done to secure it for them by erecting a building from which they can find their way out with ease, by using materials of fire-resisting qualities, by dividing the house into many risks, and by providing separate departments for all the trades and businesses of the house.

If the public were better acquainted with the means of getting out of places of amusement, there is no doubt they would feel safer when visiting them. A great number enter with the idea that they could never find their way out if they wanted. This is not to be wondered at considering what some of the entrances are, that the entrances are not always the exits, and the exits not always in nightly use. What are commonly labelled "emergency" doors are too often found locked and bolted—they are therefore worse than useless.

Such notices as "In case of need," "Exit in case of fire," "In case of panic," "Emergency," "Alarm exit," *should never be seen*; they only suggest the presence of danger, which should never be brought to the minds of the audience. Above all, the architect should study to obtain simplicity and uniformity of design in the plan. Let both sides of the house be as similar as possible. Where there is a pit entrance on one side, let there be a corresponding one on the other; where there is a gallery staircase on the right let there be a similar staircase on the left. Place all entrances and exits where they can easily be found, and have them all used nightly every time the house is open to the public. All seats should be numbered, and the house licensed to hold that number, and no more admitted under penalty of heavy fines,—then the gangways would be left unobstructed. Until the manager is fined passages will continue to be blocked up, and the weak-minded man will be found who is willing to part with a sixpence to the obliging attendant for a camp-stool or loose chair for his own personal convenience but to the danger of his fellow-visitors.*

Judgment in the choice of materials with which to construct the building requires such great care and study that too much importance cannot be placed upon this branch of the subject. The materials employed for the erection of places for the assembly of the public, whether for amusement, instruction, or devotion, must be in every sense of the words "the best of their several kinds." The scantlings, or thicknesses, must be far in excess of what would appear to be necessary for the actual and present work which they have to perform, so that they may resist any shock or pressure that may from any cause be brought to bear upon them. In short, a

* The public themselves are greatly to blame for the way in which they enter places of amusement. They are, however, easily led, and it is a pity other managers do not follow the example of the managers of the Shaftesbury and Savoy, and compel the adoption of the queue system; then many, who cannot afford the dearer seats of the house, would be able to visit the cheaper parts in comfort and safety.

theatre, or any building of public resort, must of necessity, in comparison with other buildings, be exceedingly costly. In this we refer only to the structural part, leaving out of consideration the decoration and fittings.

As long as there are cheap buildings, danger will be rife. Sometimes, where a place of amusement is in a leading thoroughfare, the ground-floor is set aside for shops. This cannot be too strongly protested against; the reason that it is done is, of course, to get the rent of the shops, and thereby lessen the cost of the premises: but it robs the house of the very means of providing good entrances and exits, which it would otherwise glory in. We may say "glory in" advisedly, for every manager glories in his exits, and will tell you his house has better and more numerous exits than any other building in the town. Business or trade premises within the same block of buildings should never be allowed: it is only adding the risks of such trade to that of the theatre or hall. The dangers accruing from the surrounding property are often as great as from a theatre itself. In no case should persons be allowed to live or sleep, as is often done, in or about this class of building; it only increases the danger, through the carelessness of the class of people who are likely to occupy the position of caretakers. The house should be left at night to a proper fire-watch, not to persons who have been occupied in other callings all day, and who therefore are in want of sleep at night.

In enlarging theatres and halls, adjacent premises are often taken in by knocking openings in party-walls, perhaps for an extra scene-dock or additional dressing-rooms. The house next door is taken, and though never designed or built for the purposes of a public building, it is brought into the same "risk." A building, or part of a building, not specially erected for "show" business, should never be used for such purposes, as it is nearly sure to be unfit for them.

In regard to choosing a site for a theatre, it may be said that no house should be permitted to exist that is hemmed in on all sides, with only a narrow entrance as a frontage in a public thoroughfare. We too often thrust our places of amusement into cramped and crowded spaces, not caring as long as they are in the right quarter of the town for a paying concern. This, more frequently than not, is the first thought, and it is not considered if the site adapts itself to the requirements of a public building. True, it is difficult to obtain a building isolated on all four sides, and it is of course no use building a house where it will not pay; but never ought a place of public resort to be permitted where there are not wide streets running past three sides of the building, with the fourth side cut off from adjacent premises by a high party-wall, many feet higher than the buildings on either side of it.

One of the most important points to be borne in mind in planning may be called the "party-wall system;" have as many party-walls in the building as possible, making thereby every division of the house a separate fire risk. Do not be content by merely dividing the stage from the auditorium, but isolate the workshops from the main building, the dressing-rooms from the stage, the stage from the auditorium, the auditorium from the offices, cloak-rooms, saloons, corridors, passages, &c., &c. Divide each and every one of these and other sections of the house from all others vertically by strong brick walls, filling the openings with fire-resisting doors, and horizontally by fire-resisting floors. Should a fire occur in any section it would be localised, and if not extinguished, left to burn itself out where it originated, without danger to other parts of the building. The position of the workshops should be such as to ensure an entirely separate building, connected with the rest of the house by one opening only, which should be closed by a double fire-resisting door, a door which should on no account be allowed to be opened during the time of a performance. Should space permit, an open area should be left between the workshop and the theatre proper, but where no area can be obtained, a thick brick party-wall, passing through and above the roof, should divide the workshops from all other parts of the house. Provision should be made in the workshop section for paint room, carpenter's shop, property-making room, and docks for scenery and property not in nightly use.

The painting gallery should be placed where a top studio light could be obtained, which lights should be protected from falling materials, timbers and sparks by strong wire guards. There is no special danger from scene painting, as is sometimes supposed; oil is not the medium employed except when scenes are wanted for out-door use, to resist the weather; as in the cases of open-air plays and scenic decorations such as are used in exhibition grounds.

The stage is too often used as a carpenter's shop—a custom which should never be allowed; the many dangers thus incurred need no pointing out, yet it is strange, that seldom is a special room provided for the carpenter: this work in some houses used to be carried on over the auditorium ceiling, but at any rate in London this has been stopped. A special workshop for each trade should always be provided. The gasman, the electricians, the bill-poster, the needle-women, the cleaners, should all have their respective rooms.

Many theatres still have dressing-rooms which are little better than dark holes under the stage, over-heated boxes, made of match-boarded petitions, on flies or stage floor, devoid of ventilation and light. It should be remembered that too often dressing-rooms are overcrowded, and that the heat from the glaring gas-lights over each looking-glass, where the actor "makes up," renders the room unfit for occupation. The remedy is in the hands of the architect, and is, complete ventilation; not only should as much window-space as possible be provided, but also inlets and outlets for fresh air at the floor and ceiling levels, since, unfortunately, one cannot depend upon the occupants of the room to open the windows. Every dressing-room should have a separate washing-basin for each performer, with water laid on and waste-pipes properly trapped; this would avoid the slopping about of water, and also encourage cleanliness among the poorer classes, who are engaged as supers and extras in such large numbers at many places of entertainment. Gas or electric light should be placed over each looking-glass, otherwise the artists will provide candles for their own convenience, and add greatly to the risk of fire.

Dressing-rooms might be with convenience placed to the right and left of the stage, on one side for men, and the other for women, each block separated horizontally and vertically from the stage and the rest of the building by brick-walls and fire-resisting floors. There should be separate staircases, and direct exit into the street from each section; the construction throughout should be fire-resisting, no more wood being used than is actually necessary for the provision of dressers' drawers and hanging cupboards for the disposal of the costumes in constant use. For the stock of costumes a special wardrobe should be provided. There should be no fireplaces in dressing-rooms; hot water or hot air should be used for heating purposes. The stage floor and sliders must of necessity be of wood, on which to set the scenes with ease, but much of the machinery might be well made in iron, and answer the purpose much better than the present clumsy bridges and traps, in which no alteration or advance has been made for many a long day.

On a level with the stage there should be scene-docks and property-docks, for the stowage of the scenes and properties in constant use; all other scenes and properties should be placed in the workshop section above described. The mezzanine and cellars below the stage should be used for the purpose of the machinery only, and on no account should rubbish and scenes be allowed to accumulate under the stage. Here too often the band-room is situated, and other rooms run up by the stage carpenter, after the building has left the hands of the architect. There should be a separate passage to the orchestra, so that the band need never approach the precincts of the stage or pass through the auditorium. Proper accommodation must be supplied for band, band-master, stage-manager, firemen, property-master, and all other sections of the staff employed behind the scenes.

The gridiron above the stage must be made sufficiently strong to carry the weight of the cloths, &c. Cases have been known where it has given way under the weight of the scenery, and let everything down in dangerous confusion on to the stage. The construction of the gridiron, flies, and fly-rails, should be of iron. Proper staircases should be provided, to enable the flymen to escape in case of danger; and direct exit into the street should not be forgotten for the stagemen and any who may be employed on the stage.

The stage should be divided from the auditorium, as is now generally recognised, by a thick, solid brick proscenium wall; this should be arched over the opening, passing through and for some height,—not less than 3 ft. 6 in.—above the highest part of the roofs of stage and auditorium. There need only be one opening in this wall in addition to the large or proscenium opening: namely, one pass door, from the stage to the front, for the acting manager. This opening should be protected on both sides of the walls by fire-resisting, self-closing doors. The stage should undoubtedly be cut off from the auditorium by some sort of fire-resisting or smoke-proof curtain. The failure of some of the iron curtains used on the Continent and in America has shown that they are not always to be relied on, and it is not so long ago that one stuck in a London house, and the audience had to depart without seeing the play. Thin iron curtains are really useless to retard fire, although for a time they would keep back the smoke, and allow the auditorium to be cleared. Asbestos curtains have been advocated, and seem far more fire-resisting in character than the iron curtains generally adopted. Water curtains have been proposed, but as these could not be periodically tested, on account of the destruction of property that would ensue, they cannot be recommended. Whatever is adopted must be in constant use, for anything designed to act only in case of need or in the outbreak of fire, is liable to be found wanting at the very moment it is needed. The fire curtain must be used nightly and between every act, to ensure its being in working order, and to let the audience know that it exists, helping thereby to strengthen that confidence of safety which is the cure of all fear and panic: for an "emergency" curtain coming down unexpectedly would be but the signal for a stampede.

Everything in and about a theatre, to be of any good, must be in constant use. Automatic water-sprays, and appliances that depend upon the solder melting when a certain heat is attained, and all such-like arrangements, are of very doubtful value. The system is altogether wrong. You depend upon the existence of the very danger you are trying to overcome; and where automatic appliances are provided people are apt to put such reliance in them that they ignore the ordinary precautions and become careless in their false security.

In regard to lighting, no precaution should be left untried to mitigate the dangers arising on the stage, for it is here we have to contend with the great risk. The use of the electric light has reduced the danger more than any other step that has yet been taken, but there are still hundreds of houses where an immense amount of gas is used nightly, too often in a careless manner. As the pipes are being constantly connected and disconnected during the performance, small escapes occur near naked lights, which makes one wonder that accidents happen as seldom as they do. All gas lights should be protected by wire-guards throughout the whole house.

The gas or electric light should be under the control of an expert, with a sufficient staff

of assistants. This man, during the whole time the house is open, should be stationed at the indicating plate fixed on one side of the stage near the curtain, on which plate every cock should be distinctly labelled, naming the section of the lighting system it governs, so that no error can possibly be made, and the lights lowered or put out in the wrong part of the house. A mistake like this, slight in itself, might lead to dire consequences. It takes little to start a panic—once started it is hard to stop, and prevention is better than cure.

Gas-meters should be placed in a specially-prepared and ventilated vault; the supply-pipes should be of hard metal, left visible, and coated to prevent corrosion. There should be a stop-cock on the main in the street, near the stage door, at which entrance the key should be kept, to cut off the gas from the house in case of fire. Separate meters should be fixed for each section of the house, and the gas supply made distinct, and where frequented by the public a dual system of supply should exist.

Sun-burners are preferable to gaseliers, as they greatly assist the ventilation of the house by the up draught they create; but they should be periodically cleansed, and accumulated carbon removed. This also applies to all other gas-fittings; a foul gas-burner may at any time drop a spark on inflammable materials in dressing-rooms or elsewhere.

Although the electric light is so much better than gas for lighting public buildings, it is not without its attending dangers. Recently it was reported at the Royal Opera House, Madrid, that an unusual stir was noticed on the stage, and the stage-manager requested the audience to disperse, as an accident had occurred in the electric-lighting machinery, which made it impossible to go on with the performance. Much excitement and alarm is said to have been created behind the scenes among the employés, for two of their number had been injured by the electric wires. With electricity, as with gas, safety depends on having everything in proper order. The principal danger from fire arises from over-charged wires.

It is advisable not to depend entirely upon the gas or the electric system of lighting. The electric light is sometimes apt to fail, perhaps only for a moment, from such accidents as an over-heated bearing, a broken belt, or other unforeseen cause. Although it may leave the house in darkness but for a few minutes, panic will prevail. To avoid all this, oil lamps should be placed about the building, in all sections, "in front" and "behind." These lamps should, like the notices on the walls, indicate the direction of the exits, with white lettering on red glass ground. They should be fed with oil, not spirit, and be lit before the admission of the audience.

Provision for plenty of window space should be made in all parts. This would admit of the use of artificial light being discontinued during the day, avoiding one of the great risks in such building as the careless handling of lamps, candles, and matches. Many people are in the habit after striking a match of throwing down the semi-burnt incandescent end. Firemen say that this is the origin of a large number of fires. For other reasons it is a mistake. It is a great blunder to make a place of public resort dark. In a house flooded by day with as much light as our varying climate will allow the women whose duty it is to clean the "front" of the house would not have the opportunities of scamping their work as they now do. Darkness means the accumulation of dirt and rubbish in all odd corners, ready to flare up on coming in contact with the slightest spark. A theatre or hall, for everybody's comfort and safety, should be kept clean, but as long as it is a dark hole it will not be.

There should be access from any one part of the roof to any other, with escape-ladders leading to the ground. This is of the greatest value to the firemen. The construction of the roofs throughout should be of iron embedded in concrete, finished on the outside with asphalte or other weather-resisting material. It has been found with wooden roofs over the stage that the excessive heat and constant changes of temperature to which the roof is subject desiccates the trusses and rafters, and converts them into something little better than touchwood. For this reason the gridiron floor should be of iron. Parapet walls should divide each "risk" in a similar manner to all party-wall structures.

The several divisions of the auditorium should each have their separate entrances, exits, passages, corridors, staircases, saloons, lavatories, &c. Each section of the audience should have two exits, used also as entrances, in corresponding and relative positions on the plan, on either side of the house, placed so as each to take half of the people accommodated in such section. All exits and their approaches should lead directly into the street, and should be used only by that division of the audience for which they are designated. There should be no pass-doors, or emergency exits, leading from one part of the house to another. A door known as an "emergency door" is often only a trap, for when opened it too frequently leads into a passage, or staircase, already crowded to its utmost.

The number of tiers depends upon the class of entertainment for which the house is built. An opera-house must of necessity differ from a theatre for the drama, and a music-hall from a theatre for grand spectacle. It is a good thing, however, to reduce the number of tiers where the business will allow. A high building is a mistake for seeing, if not for hearing, as well as for safety. The arrangement of seats should be such as to allow a 3 ft. 6 in. gangway at either end of every ten to twelve seats. This would avoid that disagreeable pushing-by of the late-comer, who has a seat in the centre of a row, and who enters with no feeling of regret for the disturbance and discomfort he produces. The widths of the seats depend upon the parts of the house in which they are placed; but by the By-laws of the late Metropolitan Board of Works each person should be allowed 1 ft. 6 in. by 2 ft. 3 in. This would, however, scarcely do for the occupant of a half-guinea stall, although the 6d. gallery might be contented with it. Every seat should be divided and numbered, and the house licensed to contain that number only. Seats should be made to tip up automatically on the occupant rising, so as to widen the distance between the rows for the convenience of people getting in and out. All seats should be securely screwed to the floor, and be constructed of iron frames to reduce the inflammable contents of the house. There need not be anything combustible in the auditorium beyond the seat-stuffing, the curtains to the boxes, and the carpets, and even these latter might be done away with, and wood block or parquet floors substituted.

Staircases and passage-ways should be from 4 ft. 6 in. to 5 ft. wide, such width being only sufficient for 500 people. Where the division of the audience is in excess of this, additional staircases and passage-ways should be provided, rather than the width of the original staircase increased. By this means every 500 people would have a separate and distinct way to the street. Staircases should consist of flights of not more than eight or ten steps, intersected by wide landings to break the possibility of stumbling and falling over one another, that long flights entail. There should, of course, be no winders or steps at half-landings. The steps and landings should be of concrete with bearings on solid brick walls at both ends; brick arches should be turned at intervals to support long passage-ways or landings; these are better than iron joists, as brickwork will stand changes of temperature where iron will not. A square staircase is perhaps the best form, having six to eight steps to every one of the four flights, with a square landing at the bottom of every flight; the inner, or newel wall, should be built of solid brickwork, with the steps and landings securely bedded on it. This wall should be carried to the same height as the outer wall, and the whole staircase roofed in with a solid fire-resisting ceiling.

Strong handrails, on brackets built into the walls, should be fixed to both sides of all flights of steps and landings, leaving a space of 3 in. clear between the wall and the hand-rail, to allow room for a firm grip. So as not to lessen the width of the staircase by the projection of the handrail, a chase could be cut in the wall parallel with the handrail, thus allowing room for hand between the rail and the wall. This, however, tends to weaken the wall.

Slopes should always be adopted where only a slight difference in the levels exist; never should single steps or flights of three or four steps be allowed.

The corridors behind each tier of seating should be of such superficial area that the whole of the occupants of each tier could easily be accommodated therein without crushing. The corridors should be divided, on the party-wall system, from the auditorium by brick walls and self-closing fire-resisting doors, so that immediately the audience left their seats and reached the corridor, they would be in perfect security from any fire or smoke that might be filling the auditorium.

Fire-resisting doors in the "party-walls" should be hung to close automatically, in duplicate, one on each side of the wall, and fixed into iron frames built into the walls. The material of which to construct fire-resisting doors is difficult to decide upon; if of iron, to be of any real service to retard the progress of the fire, the metal would have to be used in such thickness that the weight of the door would be very great. Thinner metal doors are serviceable to keep back the flames for a time, but are useless to stop the fire. Concrete doors in iron frames on wire netting have been tried, but they are heavy and liable to fracture. Perhaps there is nothing better than a good solid thick oak door, and these, at any rate, could be used in the minor divisions of the auditorium. Thick wooden doors lined with iron would be better than thin iron doors.

A fire-resisting door, as nearly perfect as possible, could be made upon the same model as safe doors, having an inner case of iron packed with sawdust and alum, surrounded by a strong well-bound and well-hung outer case; these would be heavy and expensive, and as all fire-resisting doors should be self-closing, in some degree dangerous, but they should be used to divide the larger risks of the house, such as workshops from stage, stage from auditorium, where the doors are not in frequent use.

The question of what fastenings should be used seems a small one, till one remembers the terrible disaster which occurred some years back in Sunderland, only because the wrong kind of bolt was used on a door. In this case, if we remember right, a common barrel-bolt caught in a hole in the floor, and the door remained only partly opened, while hundreds of poor children were crushing each other to death in their struggle to get out. One cannot lay too much stress on the fact that it is from these insignificant and minor details, which are not thought of sufficient consequence to receive the attention that experience afterwards teaches they require, that the death-list is swelled. Bolts, when used, should be of such a nature that, if lifted, they will not be in danger of falling and catching in the floor.

Locks are bad, padlocks worse; keys are seldom to be found when required in a hurry; for instance, in the recent disaster at Forest Gate, we hear of a key that was not forthcoming when wanted; a door barred and padlocked is hard to burst open, and never should such fastening be allowed in a public building. What is required is a fastening which will enable those who are inside to let themselves out at will, and with ease, while it acts as an effectual barrier to those outside. This we know can now be had, and it is a question whether its use should not be made compulsory.

The booking of all parts of the house would do away with the necessity for barriers at the pay-boxes. Where these are used they should be hung to open outwards, and not made so as to depend upon the memory and intelli-

gence of some attendant to remove or unship them.

The pay-boxes and box-office should be made a permanent part of the building, so arranged as to be in proximity to the treasurer's office, and under his supervision. Pay-boxes may be so placed that they may serve for more than one division of the house, by having pay-windows from the same box in two different passages, thereby saving the expense of one money-taker nightly, and helping to provide a house cheap to work. Some theatres are much more profitable to work than others, on account of such details as these having been observed, whereby the working staff can be reduced. The treasurer's office should be planned with regard to the fact that therefrom the whole of the staff, actors and actresses, are paid weekly, and assemble there in large numbers. There should, therefore, be a waiting-room, pay-office, and private-room, with the safes built into the walls. The offices for the acting-manager, and his staff of clerks, should be on a similar scale in the same suite.

Every means should be taken to keep places of public resort at an even temperature, thus adding to the health, comfort, and safety of all. The stage must be well ventilated, and, at the same time, there must be no draught to cause the scenery to flap about. Shafts immediately over the "gridiron," with gas-jets burning in them to cause an up draught,—on the same principle as the sun burner in the auditorium,—would carry off all that foul, heated air which hangs about a theatre for hours and hours after the performance is over. The up-draught caused by the shafts would serve another valuable purpose. Should a fire break out on the stage, the smoke would immediately find an escape, instead of rushing, as it would otherwise do, into the auditorium, and up towards the sun-burner. The gas jets in the shafts could be regulated by the gasman at his indicator-plate on the stage, when the up-draught should be cut off. Fresh air should be admitted to the auditorium as near the floor-level as possible; in winter it should be previously warmed; and the number of inlets should be regulated by the number of people that the house will seat. Gas-burners in corridors or passages are bad, and should be replaced by electric light; however, where they do exist they should have over them a funnel-shaped flue, by which the products of combustion could escape.

The number of deaths indirectly caused through breathing bad air in crowded buildings is probably far in excess of those caused by fire in such buildings. How frequently do we hear of colds caught through going to this play or that concert, to say nothing of the minor inconveniences of headache and lassitude next day? With regard to ventilation, buildings of this sort have been left too long to take care of themselves; it is true our new theatres and halls show great advance in the right direction, but old houses are left untouched, are still poisonous pits and little better than slow death-traps. Large sums of money have been expended in providing against contingencies which may not arise, while the fact that thousands upon thousands are nightly sowing the seed of disease and untimely death by breathing poisonous air is totally ignored, and neglect is shown in many sanitary matters in public buildings.

In regard to materials it is now almost a truism that the accepted significance of the term "fireproof" is an erroneous one. Materials that are incombustible are not, therefore, fireproof. Take, for instance, iron and stone, both recognised as fireproof substances, yet they are among the first materials to suffer under excessive heat or sudden change of temperature. Wherever possible brickwork is to be preferred in preference to any other material. Every opening should be arched over, and the use of lintels of wood or stone discarded.

The floors of the various tiers should either be constructed of iron embedded in concrete, or of timber in very large balks, of the hardest description, such as elm or oak, or a wood with qualities such as the Australian iron bark. Where wood is used it should be thoroughly protected from the action of fire by being thickly coated with gypsum or plaster of Paris. The pit and stall floors should be of concrete covered with wood blocks for warmth and comfort; all the rooms behind the scenes should be similarly treated. The floors of corridors, passages, and landings, should be constructed of concrete supported upon brick arches, abutting against the brick walls. Never use an iron joist where a brick arch can be turned.

Where iron is used to form the back-bone of the constructions it must be completely embedded in cement concrete, with no face to be exposed to a fire. The concrete should be composed of the very best Portland cement, with the aggregate of calcined material, such as broken bricks or pottery, and where it is used for light partitions of coke breeze. The staircase, as before observed, should be constructed of the same material or of some approved hard artificial stone or fire-clay, with solid steps, having a bearing both ends on brick walls. By its contraction and expansion iron adds to the danger of fire, as frequently brickwork is pulled over by the ironwork, and walls which would have stood the fire unhurt are torn down. Where iron is used it must be well bedded in cement or fire-clay, but even then avoid its use as much as possible.

Wood, when used in large balks, and of the harder sort, especially when protected with plaster, is preferable to naked ironwork. Wood is dangerous chiefly when used in thin slices.

Plaster is a valuable fire-resisting agent, it is light and resists fire for an indefinite period, it adapts itself to the entire enrichment and decoration of the auditorium, from ceiling and proscenium frame to circle fronts and private boxes.

In choosing materials for the construction of public buildings always give the preference to those that are already calcined, and have undergone the action of great heat; these will not add fuel to the fire.

NOTES.

THE meeting of members only at the Institute on Monday, specially convened by a requisition in order to pass a vote in favour of a resolution to obtain legal powers to render it compulsory on all practising architects to pass the examination by the Institute, was largely attended, and was at all events instructive in one sense, as showing who are the people within the ranks of the Institute who are calling out for "registration" as a means of raising the profession. To have to listen to exhortations in this direction from members who "'appen to know" this and that in favour of it, and who define architecture as practical work with "perhaps a little art added on to it, more or less" (a good deal less, we should imagine), is a kind of degradation which certainly gives some excuse for the position taken by several of the real artists of the profession who refuse to have any connexion with the Institute. They are at all events safe from this kind of thing. The meeting was of course called as a "move" in favour of the scheme before Parliament, at the instance of some of those interested in it. The full report will we believe be in the hands of all members of the Institute in a few days, as by another "requisition" (for which, in accordance with the By-law, six signatories were with some difficulty obtained) the sense of all the members is to be taken on the question by a general vote. We need only now observe that an amendment against the proposed resolution, put by Professor Roger Smith, was carried by a large majority, and we hope that members who vote upon it from a distance will not fail to read the arguments in favour of the amendment (now the substantive motion), and will also note the relative status and position in the profession of the speakers on both sides, bearing in mind that those who actually spoke in favour of Professor Roger Smith's amendment represented only a very small proportion of the well-known and eminent architects who attended to give it their support.

THE proposed new Employers' Liability Bill still includes the doctrine of "common employment," so obnoxious to many working men and their Unions, but which we believe it would be found impossible to get rid of without serious risk of employers being victimised. Other modifications of existing law are in favour of the artisan, especially that which gives him a right of claim for compensation for injuries sustained in obeying the orders of any foreman or other person whom he was bound to obey, whether the latter is or is not "ordinarily engaged in manual labour." This is a step in the right direction, though it may perhaps somewhat increase the difficulty, often considerable as it is, of defining clearly wherein "superintendence," and therefore the right to give orders, consists.

IF such terrible tornadoes as that which has produced such disaster in the United States should appear to be on the increase in that part of the world, it seems almost as if those in danger of them would have to give their minds to the production of some new method of constructing buildings which would give, if not security, at least greater chance of safety and less of destruction under such a tempest. The construction of buildings which should be comparatively earthquake-proof is a question that has been seriously and practically considered; is it possible that the next step must be to endeavour to make them tornado-proof? If there is any possibility of doing so, the Americans, who are at present principally subject to this scourge, are perhaps also the most likely of all people to have the spirit and ingenuity to make some serious attempt to secure themselves against its worst consequences.

TO the last number of *L'Architecture* M. Lenoir makes an exceedingly interesting communication in the shape of a copy of an original document in his possession, consisting of an order by Louis XIV. dated October 31, 1660, for the completion of the Louvre and Tuileries and of the gallery to unite the two palaces. M. Lenoir communicated the document a week previously to the Académie des Beaux-Arts, prefacing it by a short résumé of the main points in the history of the Louvre. The order itself is of so much interest that it is worth while to reprint it for our readers:—

"31 octobre 1660.—Ordre du Roy pour faire achever son Chateau du Louvre et estre joint avec celuy des Thuilleries.

Extrait des registres du greffe de la prevosté de l'hostel de sa Majesté et grande prevosté de France.

Le Roy ayant resolu, par l'advis de Monsieur le Cardinal Mazarin, son premier ministre, de faire acheuer incessament tant le bastiment de son chasteau du Louvre que celuy du palais des Thuilleries, pour estre joint ensemble, suivant l'ancien et magnifique dessein qui en a esté fait par les Roys ses predecessours, et pour cet effet donné ses ordres au Surintendant ordonnateur général de ses bastimens et à l'Intendant en exercice, de faire abbatre dès à present tant l'hostel de Bourbon que les autres hostels, maisons et bastiments qui se trouueront dans l'enceinte du dit bastiment suivant le dessein, à commencer par ceux dont les places doiuent seruir pour en faire la fondation, et de faire faire le plus grand préparatif qui sera possible tant de pierre dure, qualités des carrieres de Saint-Cloud, Meudon, Vaugirard, Arcueil, Gentilly, fauxbourg Saint-Germain, et pierre tendre de Saint-Leu, Trossy, Tineray et autres lieux et carrieres généralement quelconques, sans rien excepter, chaux, sable, bois en charpenterie et manuiserie de toutes qualités, et autres choses et matieres nécessaires pour la construction des dits ouvrages, les quels matériaux seront pris et enleués dans tous les dits lieux ou ils se trouveront, en les payant raisonnablement, et d'autant que pour la prompte perfection des dits bastimens, l'intention de Sa ditte Majesté est d'establir et dresser quatre grands atteliers royaux pour commancer à trauailler, commençant au premier jour du mois de mars de l'année prochaine mil six cent soixante un,

en plustot sy le temps le pouvait permettre, et qu'il seroit impossible de fournir suffisamment d'ouvriers ny de materreaux es dits attelliers, s'jl estoit permis aux particuliers d'entreprendre aucuns nouveaux Bastimens, outre que cela retardoit entierement le seruice et le plaisir de sa Majesté, et quelle desire que tous les ouvriers en quelque vacation qu'jls soient, qui se trouueront a Paris et aux Environs, mesmes ceux qui viendront des provinces, soient seulement employez et reçus es dits attaliers du Louvre et en ceux de Vincennes, Val de grace, et autres bastimens et maisons de sa Majesté, et payés ponctuellement de leurs journées au prix courant et au taux qui sera estimé juste et raisonnable, selon le cours du temps; et pour ses considerations, Sa ditte Majesté defend très expressement à tous particuliers, en quelque qualité et considerations qu'jls soient, sans nul excepter, d'entreprendre aucun nouveaux bastiments, ny faire aucuns reparatifs de matter-eaux; tant dans sa bonne ville et fauxbourgs de Paris que dix lieües à la ronde, sans permission expresse de sa Majesté signée de l'un de ses secretaires d'estat et scellée de son grand sceau avec attache du dit sieur surjntendant des bastimens, à peine de Dix mille livres d'amande payable sans depart à l'hospital general; et aux ouvriers de prison pour la premiere fois et des galères pour la seconde; mande sa ditte majesté au dit surjntendant et ordonnateur d'yceux en exercice, de tenir expressement la main à l'execution des présentes. Enjoignons au Sieur marquis de Sourches prévost de son hostel et grand prévost de France, et Lieutenant civil de Paris et tous autres ses officiers et juges qu'il appartiendra, d'y tenir la main et donner l'assistance comme en chose qui regarde son seruice et son plaisir particulier, et afin que nul n'en prétende cause d'jgnorance, elle vent et ordonne que la présente ordonnance soit publiée à son de Trompe et cry publique, et affichée dans tous les lieux de la ville et es faulxbourgs accoustumés; Fait à Paris ce dernier jour d'octobre mil six cent soixante. Signé Louis et plus bas de Guenegaud.

Collationné an huitieme Registre des enregistrements du greffe de la prévauté de l'hotel de sa Majesté et grande prevoté de France Follo 168 V° et R° et V° 169 par nous greffieren chef soussigné

DUVOIGNE."

THE District Surveyors' Association have addressed to the London County Council a short summary of their opinion, expressed in five resolutions, in regard to certain clauses of the County Council General Powers Bill which have reference to the working of the Building Acts. The following are the terms of the resolutions in question:—

"*Section* 63.—Appeal against Certificate of Architect as to General Line of Buildings.—It was resolved that approval should be expressed of the tribunal provided by this section, consisting of one member appointed by the Council, one by the R.I.B.A., and one by the Institution of Surveyors, but that the members thereof should only be appointed for a limited time, and reappointed from time to time, say every session, also that the Councils of the R.I.B.A. and of the Institution of Surveyors should be empowered to make the appointments.

Section 64.—Power to Authorise Larger Buildings without Party Walls.—Resolved that this power should be limited to very special cases, and where such are approved by the London County Council, the reasons for the approval should be specified in writing with the approval, but in every case where such building or division thereof exceeds 216,000 cubic feet the construction shall be specially approved by the D. S., or in the event of disagreement, by the London County Council, who shall also appoint a special fee to the D. S. for the special labour and responsibility involved. Also that it is assumed that under this section a properly constructed fireproof floor or similar party structure should be deemed to form a sufficient separation between the divisions of the building, as in section 27, clause 2, of the Building Act, 1855. Further, that in view of the difficulties which have arisen by reason of there not being any definition in the Building Act, 1855, of the meaning of the words, "Warehouse, or other building used for the purposes of trade or manufacture," it is very desirable that the Bill should give such definition.

Section 66.—By-Laws as to Plastering, &c.—Resolved with regard to Clause 1: That the supervision of the work referred to is not such as falls within the general duties of a D. S., but if the Clause became law provision should be made in the By-laws that proper notice should be given to him of such work. Resolved also that any By-laws should be subject to the same approval by the Secretary of State as under the Act of 1878.

Section 69.—Buildings Abutting on more than One Street.—It was resolved that the provisions of the Section would involve, in many cases, a sacrifice of property, and great injustice where the corner plot was owned by one person and the adjoining land in the side street by another, which the objects to be obtained do not appear to justify, and that they would induce owners to bring forward their frontages in side streets more than they otherwise would, thus tending to lessen the total width of the space between the houses by shortening the forecourts or gardens.

Section 72.—Height of Buildings.—It was resolved that the regulations should be confined to buildings abutting on a street, and that the height should be governed by the width of the street, as in Paris and other cities; that for any other buildings the limit should be extended by the distance they may be set back from the street up to a total height of 100 ft., as rules for buildings of that height are given in the Building Act, 1855, that the height should be measured from the crown of the roadway opposite the centre of the building, that the regulations should not restrict existing rights in rebuilding, that the limitation of height proposed would exclude important architectural features, such as towers, gables, dormers, &c., and that the section should be modified so as to allow them."

IN regard to the subject of accommodation for our troops, especially on the hut-system, it may be of interest to know that the German Government intends quartering one of the line battalions in a camp of twelve "pasteboard" huts. These huts, each of which measures 32 mètres by 7 mètres, have a skeleton, or rather framework of wood, the walls and roofs being of pasteboard, double, with an insulation of compressed peat and similar materials, which will tend to keep the cold out in winter and the heat off in summer. In spite of their somewhat fragile appearance, these huts are strong and well-made, and promise to be a success.

THE new "Asyl" which is about to be erected by the Italian Alpine Club, in memory of Prince Amadeus, on one of the points of the Southern Alps, will be by far the highest inhabited abode in Europe, its altitude above the level of the sea being some 4,000 mètres, whilst the St. Bernhard Hospice has only 2,472 mètres, and the meteorological station on the Pic Mezzogiorno only 2,870 mètres. Asia and America, however, have settlements, and even cities, at the same and even greater heights,—for instance, Potoli, in Columbia, a town with 30,000 inhabitants, lies 4,900 mètres above sea-level; and the gold-searchers of Thok-Jakounes in Thibet, numbering some 6,000, have their settlement at an altitude of 5,000 mètres.

THE competition for designs for a new "Arts and Science Museum," at Dusseldorf, has been decided, the first prize falling to Herr Karl Hecker, of Dusseldorf, and the second to Messrs. Lieblein & Wiegand, of Offenbach. It had been generally expected that this competition would show some interesting designs, but, on the contrary, the jury had but a very poor collection to choose from, the majority of the forty-nine designs sent in being far below the usual standard.

THE cutting of the new canal in Sweden between the Cattegat and Lake Wener, or rather between the towns Uddevalla and Wenersborg, will be taken in hand as soon as possible, the Government having approved of the scheme. The new connexion, some twenty-five kilomètres in length, is to have a depth of seven mètres, and will hence permit ships of pretty large tonnage to pass,—a great advantage to the commercial intercourse between inner Sweden and the outer world. The export of timber will be greatly facilitated, and the large iron foundries in the interior will be specially benefited by this new waterway.

THE honour of being chairman of the jury to this year's International Art Exhibition at Munich has fallen to an architect, Professor Albert Schmidt. This is the first time that a member of the profession has held this responsible post, and this fact is all the more worthy of note since the Munich artists, among whose ranks painters are in a great majority, have up till now nearly always selected a painter for this function.

AMONG the list of proposed new monumental buildings for Berlin, one, a new home for the Prussian "Landtag," has lately again come to the foreground; but owing to practical reasons it will scarcely be possible to think of erecting this building till the members of the Reichstag have taken quarters in their new house on the Kœnigsplatz. A second scheme much talked about of late, the new building for the Academy, or rather the proposed buildings for the Academy proper at Berlin and for the Academy-Schools at Charlottenburg, is as yet but in its initial stage, neither sites nor programmes having been definitely fixed. A well-known Berlin architectural firm is, however, working out a series of sketch designs for the Berlin building, which are to be laid before the Emperor for approval; and a second firm of repute is working out a design for the Schools at Charlottenburg on a site in close proximity to the buildings of the Royal Technical College.

IT is proposed, as we read in the *Daily News*, to set up a stained-glass window in the parish church of St. John the Baptist, Mersham, near to Ashford, in Kent, to commemorate the rectorship there of one who may be legitimately designated as father of the medical profession in this country. Thomas Linacre, physician, scholar, and priest, the friend of Lily and Melancthon, was born *circa* 1460, and, it is supposed, in Canterbury. Having studied at Cambridge, Oxford, Padua, and elsewhere in Italy, he was appointed tutor to Arthur, Prince of Wales, and is said to have instructed Erasmus and More in the then "new learning," viz., Greek. Two years after he had founded at his own home, since known as "The Stone House," No. 5, over against Bell-yard, in Knightrider-street, the College of Physicians, Linacre took orders, and for awhile held preferments in Wigan, Aldington, and at York Minster. Dying on October 20, 1524, at his house in Knightrider-street, which he devised to the College, Linacre was buried in Old St. Paul's, where, near to the north middle door, Dr. John Caius erected a monument to his memory. The inscription ended thus, "Thomæ Lynacro, clarissimo Medico, Johannes Caius, posuit anno 1557." Mersham Church was restored in 1877, *e curis* Sir Wyndham Knatchbull, bart., and the Reverend R. Knatchbull-Hugessen, rector. It contains several memorials to the Knatchbull family, who were seised of the manor of Le Hatch, in this parish, *temp.* Henry VII., *vide* Hasted's "Kent," Vol. III. (1790). In Dr. William MacMichael's little work, entitled "The Gold-headed Cane" (1827) will be found a notice of Linacre's portrait, therein ascribed to Holbein, as being then at Kensington Palace*; and a wood-cut, since reproduced in Vol. I. of Walter Thornbury's "Old and New London," of the house we mention. Dr. William Munk's edition (1884) of "The Gold-headed Cane" contains an account of the silver caduceus which Caius presented to the College for its President's use.

ON Saturday last the congregation of the Great Synagogue in St. James's, formerly Duke's, place, Aldgate, celebrated the hundredth anniversary of the building of their place of worship. That community of German and Polish Jews known, we believe, as the Ashkenazim, settled here in 1692. The present building, which, by the United Synagogue Act of 1870, was thenceforth to rank as the Great Synagogue, had supplanted the building that, in 1722, was built in place of one which Moses Hart had erected for their use in Broad-court, Duke's-place. It should not be confounded with the neighbouring synagogue for Spanish and Portuguese Jews, or Sephardim, in Bevis Marks, as re-built in 1701, and which is associated with the memories of the late Sir Moses Montefiore and the Disraelis. We gave an account of this latter in our columns of January 30, 1886, upon the

*Is that the portrait which, seventy years ago, used to hang in Queen Caroline's Dining-room, and has been ascribed to Q. Matsys?

occasion of the migration of a portion of the congregation to a new synagogue in Bryanstone-street, Bryanstone-square.

PERHAPS it is with a consciousness that their works are best seen and appreciated in a half light that the members of the New English Art Club have chosen to have their exhibition this year in the rooms at Humphreys' Mansions, which are almost entirely destitute of such a light as pictures are generally supposed to need, and in which half the works are seen in shadow. Thus Mr. McLachlan's evening landscape, "When the Dew Falls" (133) is in a twilight corner which perhaps materially assists the effect the painter desired, and has not been unsuccessful in producing. Other works are less assisted by these conditions, and are so lighted that it is difficult to form any judgment of what their effect might be in a proper light. In regard to some of the best works there it may be said that if the New English Art Club is supposed to consist of artists who are "in search of truth" (so we read somewhere), they seem to have stopped half way in the search. Miss Mackay's "Quiet Chat" (10) shows at a little distance a very expressive character in the attitude of the two figures: is it really any better for the fact that on a nearer view neither features nor hands can be made out? It is an unfinished sketch for a picture, that is all. Mr. Roussel's portrait of a little girl (13) is fine in colour and the expression of the head, but the hands are two lumps of dough. Mr. Sickert's portraits of Miss Fancourt and Mr. Bradlaugh (9 and 27) are powerful sketches on a large scale: nearly all the larger works are sketches on a large scale. "Is this 'terewth'?" we may ask. Or is it truth to paint a portrait of a girl with a wooden head—*vide* number 148; poor "Lily!" Truth seems to us to be realised mostly in some of the small landscapes; Mr. Paterson's "Seascale" (132); Mr. Laidlay's "French Village at Evening" (19); Mr. T. M. Dow's "A Northern Shore" (2); this latter is a study of breakers and foam on the shore on a bright and breezy summer day, which is remarkably true in the movement and lines of the water, though the foreground shallows seem rather destitute of the reflected lights which should be seen from the film of water. However, this is a very clever work. There are other landscapes or landscape and cattle-pieces which have an idyllic sentiment, towards which it seems to be thought that the omission of detail contributes. Hence the members of the club seem to lean much towards twilight scenes, which can be treated conformably with their aims. There is a cleverness in all this, combined, to our thinking, with a very pronounced affectation.

WE would commend to the attention of builders' clerks a statement made by Mr. H. H. Bartlett when presiding at the annual dinner of the Builders' Clerks' Benevolent Institution on Monday, to the effect that last year the Institution's income from invested funds and annual subscriptions did not suffice by about 120*l.* to meet the working expenses of the year, in consequence of which the Committee had to trench upon the donations given at the annual dinner last year, which they would have preferred to add to the invested fund. The Institution is doing, and has done, admirable work since its establishment, and is very economically managed. The Committee would be very glad to see a large increase in the number of members and annual subscribers. The annual subscription is but half a guinea, and there must be hundreds, if not thousands, of builders' clerks who are not members of the Institution. The offices of the Institution are at 21, New Bridge-street, Blackfriars, E.C., and Mr. H. J. Wheatley, the Secretary, would be very glad to answer inquiries. Master builders could do much to help the Institution by bringing its claims to the notice of their clerks.

THE April number of the *Art Journal* contains, under the title "An Old English Homestead," an illustrated article on that peculiarly English house, Moreton Old Hall. The illustrations are reproduced from photographs by Mr. R. Keene, the author of the article. The *Portfolio* continues Mr. Clark Russell's articles on "The British Seas," with various sketches by Mr. J. R. Wells, and a reproduction of a sea-study by Mr. Henry Moore. Mr. Armstrong contributes an article on the work of Mr. Onslow Ford (one of a series on English sculptors of the day), with illustrations, including a fine separate plate of Mr. Ford's figure "The Dance," a commission from an Indian Maharajah, along with a companion figure of "Music," of which a smaller illustration is given, and which is a very original work. At the close of the article Mr. Armstrong speaks strongly, and with reason, of the neglect of English sculptors by the Government:—

"In our English public buildings, we have niches and pedestals by the hundred, preparations made by the sanction of Government for statues which never come. The Houses of Parliament, the offices in Whitehall, the bridges, the Victoria Embankment, the Royal Courts of Justice, all these are besprinkled with empty perches, which at present are simple disfigurements. Some, of course, are waiting for statesmen or soldiers. But the vast majority belong so intimately to the architectural scheme that they could not be rightly abandoned to iconic figures. Why should not a certain number of these be filled each year?"

Why, indeed? The French Government or the Paris Municipality would have set themselves to such a work as a matter of course; but in England it would be scouted, probably, as idle extravagance.

LETTER FROM PARIS.

THE Parliamentary Committee for examination of the scheme for the maintenance of the Champ de Mars buildings did not report in a very favourable sense, and found that the maintenance of the Galerie des Machines, the central dome and its gallery, would alone involve an annual expenditure of about 160,000 francs. The Committee reported also, not without reason, against the idea of making buildings of this kind serve for another exhibition, as the novelty of decorative effect is one of the principal attractions of this kind of entertainment. This was the opinion of M. Antonin Proust and M. Georges Berger. In spite of these and other good reasons the Municipal Council, carried away by the eloquence of M. Alphand, has voted the maintenance of these structures and the transformation of the Champ de Mars into a public garden traversed by a new road connecting the Avenue Suffren with the Avenue Bourdonnais. We shall probably this summer, therefore, see the terraces and fountains illuminated by electric light as before.

The exhibition of the "Salon Meissonier" to be held in the Palais des Beaux Arts of course gives some additional public interest to this scheme, and in order to prove to the artists that in spite of the distance they are much better off here than they would be in the Palais d'Industrie, M. Alphand is prodigal of his favours to the new society, and is dispoiling the municipal conservatories in order to transform the Avenue Rapp into a great winter garden.

The Jury of Painting of the new Salon has elected M. Carolus Duran as its President and M. Galland as Vice-president. The reception of works of art, which was originally fixed for March 1 to March 8, has been postponed to April 12 for painters and the 22nd for sculptors. The old Salon does not seem to have suffered so far, at all events numerically, by the rivalry of the new one. The Jury of Painting, presided over by M. Gerôme, assisted by MM. Busson and Jean Paul Laurens as the Presidents, has terminated its laborious operations. It has been unusually severe, it is said, in its judgments this year, and has refused many painters who have been received in former Salons. 2,250 pictures have been admitted. The numbers offered have been nearly the same as last year, amounting to the respectable total of about 7,000.

In the meantime the Musée des Arts Decoratifs has just opened an exhibition in the Champs d'Elysées building, comprising about 400 works purchased from the universal exhibition of last year. At the same time, the exhibition of the "Artists Independants" has succeeded to that of the "Femmes Peintres et Sculpteurs" in the Pavilion of the Ville de Paris. As usual, this exhibition is an odd affair, and one finds really interesting work mixed with the oddest fancies both in pictures and frames: though on the whole, among the 800 paintings exhibited, there is less extravagance than in last year's exhibition.

While the second exhibition of "Peintres-Graveurs" is being held at M. Durand Ruel's gallery, the "Cercle Volney" is holding also its annual exhibition of about 200 works. M. Munkacsy on his part is exhibiting to the public the design for the ceiling which the Austrian Government has commissioned from him for the Museum of History and Arts at Vienna. The painting is of colossal proportions, and represents the apotheosis of the Italian Renaissance. In spite of its popular success with "tout Paris élégant," we are obliged to confess that, while exhibiting some fine decorative qualities, the artist has not altered or improved either the hardness of execution or the crudity of colour which characterise his ordinary work.

The pictures and studies of the lamented painter Protais have been dispersed at a general sale, after having been exhibited publicly for many days. We found among them the first sketches for more of his well-known pictures, among them the "Halte d'Infanterie," the "Manœuvres d'Artillerie," the "Chasseurs à pied à Saint Privois," the "Regiment en Marche," and other pictures well known from engravings, and which reflect the ardent patriotism of their author, who was not only a fine artist but a brave and loyal citizen.

The Committee of National Museums has not come to any definite conclusion in regard to Manet's "Olympia" picture, to which we have before referred. It has confined itself to expressing an opinion against admitting this sensational painting to the Louvre, and in favour of admitting it to the Luxembourg, but without any promise one way or the other. This undefined position will perhaps leave some room for the operation of public opinion in the matter. The attitude of the authorities is quite otherwise in regard to Courbet, once such a subject of dispute, but who now enters victoriously into the Louvre before even the regulation ten years have expired since his death. It is melancholy to add that Art has nothing to do with this decision, and that it arises from political feeling and a desire to reward Courbet for his hostility to the Empire. This is why the Louvre already possesses the famous "Enterrement d'Ornan," a picture disagreeable in colour and careless in execution, and will soon have another picture by the same artist, the "Remise des Chevreuils," which a group of admirers has combined to purchase. This work however is infinitely superior to the latter.

The Louvre has just been enriched with a fine picture by Bonington, a portrait of an old woman. There are up to this time only nineteen oil paintings of the English school, among which are four Boningtons, "Francis I. and the Duchesse d'Etampes," "Mazarin and Anne of Austria," a view of Venice, and a sketch of the Park of Versailles.

We are happy to add that, thanks to M. Guillaume, the Louvre galleries have been much improved recently in regard to comfort, and that the ground-floor especially is not given up to the cold which made it in winter almost impossible for artists and students to draw. The Museum of the Renaissance will also shortly be enlarged by two new saloons; in a few days the Tunisian collection will be open to the public, and the square built last year on the site of the Tuileries will be the object of numerous embellishments. The fine group by M. Mercié, entitled "Quand Même," will be placed a few steps from the triumphal arch of the Carrousel; numerous statues will decorate the grounds, among which will be the "Exiles" of M. Mathurin-Moreau, published in the *Builder* last year.

The work at Versailles is being continued, under the superintendence of M. Marcel Lambert. The restoration of the "bassin du dragon" has just been terminated, by M. Tony Noel, in accordance with old documents which have furnished evidence as to the original intention.

The bronze casting of the monument to General Lafayette, just completed, has been on view at the foundry. It is about ten metres high, with a granite plinth, on which is a white marble pedestal supporting the statue. On the

principal face of the monument is a bas-relief of a female figure presenting a sword to the General; on the reverse face a cartouche supported by two figures of children. Bronze statues representing Lafayette's four companions in arms are grouped, two on each side, on the lateral faces; Rochambeau, Du Portal, de Grasse and Estaing. The statues are the work of M. Falguière and M. Mercié, the pedestal is designed by the architect M. Pujol. Another memorial statue, that to Paul Bert, is exhibited temporarily on the Place de la Sorbonne, and is to be transported to Tonkin to be erected at Hanoï. This is the design of M. Paul Lenoir, author of the Berlioz statue on the Place Vintimille.

Various public works of some importance are under discussion. The rebuilding of the Mairie of the Eighth Arrondissement has been put up to competition, though it is thought by some that it would have been wiser to have adopted the design made some time since for this purpose by M. Hermant, an architect whose ability is unquestioned. Another competition has been opened for the construction in the Faubourg St. Antoine of a school of furniture design, very usefully placed in this quarter, which is almost entirely inhabited by cabinetmakers and upholsterers. The works of the new hospital in the Faubourg St. Germain are also to be shortly commenced, thanks to the liberality of Mdme. Boucicaut.

The Church of the Sacré Cœur has been relieved of its great scaffoldings, and now presents an entirely new appearance. As soon as the fine weather comes the work of vaulting the nave will be commenced, a piece of work which will hardly be completed within the year.

Another question of the moment is as to the proposed removal of the École Polytechnique to St. Cloud, to the site of the Palace burned in the Franco-German war. This is not the first time the removal of the École has been mooted; and in 1871, just after the war, there was a talk of rebuilding it where the Trocadéro now stands. Probably the same reasons then given against the change will operate now. No doubt the present building is too small, too old, and in the midst of a crowded and not too sanitary neighbourhood. But these drawbacks may be corrected, while the removal will involve so much inconvenience and interruption of the work, that it is probable the Government will confine itself to improving the present building, isolating it by large streets bordered by new buildings, where the amphitheatre, laboratories &c. can be commodiously arranged. Something of this kind must be done soon, for the present building, erected in 1794, and which occupies the sites of the old colleges of Navarre and Boncourt, is no doubt too restricted for present requirements.

The Académie des Beaux-Arts a few days ago proceeded to the election of a member to replace the late M. Diet in the Architecture Section. After six "tours de scrutin" M. Normand was elected by 16 votes out of 31. M. Ancelet had 8 votes, M. Pascal 5, and M. Dutert 2. The new Academician obtained the Prix de Rome in 1846, a first medal in the Exhibition of 1855, the Cross of the Legion of Honour in 1860, and a second medal in the Exhibition of 1878. It was he who designed for Prince Napoleon the pretty Pompeian house in the Avenue Montaigne.

At the Écoles des Beaux-Arts the prize founded by the American architects in favour of French architects has been awarded to M. Bauchain, pupil of M. André.

In consequence of frequent abuses, the Académie des Beaux-Arts have come to a serious decision in regard to the former pensionnaires of the Villa Medici having the enjoyment for three years after their return to Paris of the pension founded by the Comtesse de Caen. Henceforth this bounty, which amounts to 3,000 francs for architects and 4,000 for painters and sculptors, will not be accorded except to those who have executed a work worthy of a place in the museum to be founded for that purpose by the generous benefactress.

This last month has witnessed the death of two sculptors. One of them, Adolphe Leofanti, who exhibited in the last Salon a bust of M. Jules Simon, has committed suicide for reasons unknown, but supposed to be connected with family troubles. He was a conscientious and hardworking artist who unfortunately met with very little success.

The other sculptor, M. Oliva, who has died at the age of 66, had a certain reputation under the Second Empire. He obtained medals of the third class in 1852 and 1855, and a medal of the second class in 1861, and the Cross of the Legion in 1867. Among his most remarkable works are the statues of Napoleon III. and the Empress, those of Alphonse XII., Cardinal Guibert, Marshal Macmahon, and "The Message," a work which figures in the Louvre. M. Oliva had great talent and facility in his art, and excelled especially in portrait-statues and busts. It is to him we owe the bronze statue of François Arago, exhibited in last year's Salon, and which is to be erected in Paris.

THE MEDIÆVAL HOUSE.*

THE first impression which this subject makes upon any one who tries to grapple with it is its unmanageable extent. To try to indicate with anything like definite precision how our forefathers and their contemporaries lived in Europe during several centuries of constant change, would be a task impossible within the limits of an hour's lecture, even were it within my powers at all; and the first step must be to set bounds to the range of our enquiries. First, then, I propose to omit all mention of religious houses. As far as is possible, I shall also omit the castle. It is true that the castle was the home,—and the only home,—of many noble and gentle persons in the Middle Ages, and of vast numbers of retainers, and that it was at last turned into a very commodious dwelling; but still it was so much influenced in its arrangement and build by military considerations that we need hardly scruple to do this. Lastly, I propose not to travel far from home. English examples fail, I must admit, in several particulars to give a complete series of domestic Mediæval buildings, or groups of buildings; and we can hardly avoid going to France to fill up gaps; but it will not be necessary to go any further afield, and, as far as possible, the subject will be treated with reference to our own country only.

In one respect,—that of time,—however, the lecturer must be allowed to overstep the limits that the title seems to prescribe. Houses of Mediæval character continued to be built here for long after the real close of the Middle Ages, and these, being the most recent, are the most numerous and the best preserved, so that we shall be unable altogether to exclude sixteenth-century, and in some cases seventeenth-century, work.

Dwelling-houses have seldom been built with anything like the solidity of churches and cathedrals; consequently, they have not withstood the tooth of time so well. They are, far more than churches, exposed to damage from fire, and also to plunder and devastation in time of war or civil strife, and to so-called *improvement* in time of peace. Fortunately for the students of Mediæval architecture, church alteration and church building practically came to a standstill in this country after the secularization of the vast revenues of the Church by Henry VIII., but it was far otherwise with houses. Every owner of a historical house has felt at liberty, and in too many instances has been rich enough, to alter, pull down, rebuild,—in short, modernize after his lights,—the dwelling of his ancestors; and this has occurred more thoroughly still with the smaller, less substantial, and often less convenient houses in towns, so that we have nothing now left but what accident or chance has preserved in the shape of scattered and often incomplete specimens of the more early Mediæval house.

I propose to speak to you first about houses in towns, and then about houses in the country,—the simplest division of the theme it seems possible to introduce.

First, then, as to houses in towns.

The Middle Ages, it must not be forgotten, was a period of great and constant strife, and life and property were insecure to an extent that we cannot easily realize. Accordingly, the shelter of fortified towns was sought by persons who had anything to lose. Townsmen were content to dwell in small and crowded houses for the sake partly of protection and partly of the opportunities for trade which a town afforded. Of Saxon houses we have no remaining specimens, and next to no traces; but some information can be gleaned from ancient writers and the illuminations of old manuscripts. Ordinary dwelling-houses in towns are believed to have been small, built of wood, thatched, in most cases of one story, and often consisting of only one room,—in short, huts,—and with the fire on a hearth in the middle of the floor, and the windows closed only by shutters. Representations of palaces give, however, some reason to suppose that the kings and influential thanes had, even then, houses built of masonry, and with some attempt at decoration.

In the Norman period houses seem to have been built in London and Winchester, and presumably elsewhere, of much the same material, though probably mostly of two stories. A very curious piece of documentary evidence upon this head remains in the Assize of 1189. This name is given to a formal document, the result of an inquiry by a jury of twelve citizens of London, elected in what, I suppose, would correspond to the common hall of the present day,—"*in pleno hustingo*,"—to regulate building disputes. This document arranges that two adjoining neighbours who desire to build shall erect a party-wall of some 3 ft. thick and 16 ft. high between them, each man giving up 18 in. of his ground for it to stand on, and that either party may carry his half of the wall to a greater height if he wishes. It will be noticed that the height of such a wall would suffice for two low stories, and that the provision for heightening seems to point to the occasional habit of using three or more floors. Almost the only English examples of masonry houses of this early date occur at Lincoln, where one very well preserved small house, known as the Jews' House,* still exists. The doorway and two upper windows, of good and somewhat rich Norman architectural character, remain. There were, apparently, only two rooms in this house, and the fireplace of the upper room is curiously corbelled out over the entrance door. A peculiarity worth noting is that this house does not present a gable to the street, but has gables at the sides, so that the eaves of the roof overhang the street pavement. Remains of a larger but less perfect Norman house, also of masonry, often known as John of Gaunt's Stables, also exist at Lincoln.

Of town-houses of Mediæval architecture we find far more examples remaining in France than in England, probably because the greater activity in English towns has caused more rebuilding; indeed, in our own day in some of the French towns (such, for example, as Rouen), where manufactures have gained ground, the remaining old houses have been swept away by the score. There was very frequently, especially in the wine-growing parts of France, a vaulted cellar, usually reached by steps from the road. The ground-story was often, even if it were a shop, raised a little above the level of the pavement. The house was usually narrow and deep, and very often had a gable end towards the street. Partition-walls, such as those referred to in the Assize of Stephen's reign already cited, often existed, but sometimes each house was distinct, and a very narrow space separated it from its neighbour. The front wall next the street was mostly of masonry in the ground story, and if the house were for business purposes there would be a wide window and a door besides. Above this the front was generally of what is termed half-timbered construction; and there was usually a first floor and a story of attics, though sometimes the house was carried to a greater height. Where there was *not* a gable end to the street there would be dormer windows to light the attics. The general disposition or plan of a small house of this sort was simple enough. There would be on the ground-floor the shop (or a room, if no shop) and a staircase, a yard behind, and a low building in that yard used as a kitchen. The best room in the house was the first-floor room, occupying all the space between the walls; it was used as a living-room, and partly a sleeping-room also, and with a fireplace—a luxury not always introduced below. The upper floor, or floors, would be divided by internal partitions into smaller rooms. Sometimes, where more space was occupied, a more ambitious programme was attempted; but the one principal living-room on the first floor was almost always a prominent feature in the arrangement of the house.†

The point in structure to which attention should be first drawn is the half-timbered con-

* A lecture delivered by Professor Roger Smith at University College, London, as part of the Course of Archæology now being given there.

* Illustrated in Parker's "Domestic Architecture," vol. i. p. 40.

† Illustrated in Viollet-le-Duc, "Dictionnaire," art. Maison.

struction already referred to, and which was largely employed both in France and England, and in town and country alike. A very few specimens of it linger in London, the best being the upper parts of some houses on the south side of Holborn, nearly opposite Gray's Inn-road, which have recently been carefully cleaned and repaired.

What may be described as timber walls were in use through several centuries. They were thus built: on the top of the stone-walling, which served as a base, and was sometimes a mere foundation, or at other times a wall the height of a story, a strong horizontal timber was securely laid. This was what a carpenter would call a wall-plate. The ends of a series of sturdy upright timbers standing side by side are let into this plate (tenoned into it), and at the top of them a second horizontal timber is secured in the same way. The lengths of the upright timbers and thickness of the horizontal pieces are so adjusted that, including the two plates, the whole equals the height of a story. The floor-joists, which were heavy timbers, rest on this framework, and generally are made to overhang. A second series of upright timbers forms the main structure of the next story, which rests on the ends of the joists, and so on to the top. There are sundry minor variations in procedure, as, for example, in early times—say, the twelfth century—the timbers were close together, forming a wall wholly of timber, like that of a Swiss châlet. Later on, they were placed some distance apart, and the spaces filled in with plastering. At a late period panels so formed were sometimes occupied by tiles, and sometimes with woodwork. There are several modes of managing the overhanging of the upper floors, and diagonal or horizontal pieces are sometimes introduced for the sake of architectural effect. The gables are generally finished with a richly ornamented deep rafter called a barge-board or verge-board, and sometimes with carved timbers; and the dormer windows, when they occur, are often charmingly treated. Altogether, no manner of building can well be more picturesque or more thoroughly domestic in its appearance.*

Much building of this sort remains in country places in England, though most of it belongs to that group of buildings already alluded to as in quality Mediæval, though built after the Middle Ages had closed. There is a group of half-timbered halls and manor houses in Lancashire and Cheshire especially worth notice, including some answering to this description, and others genuinely Mediæval. In towns a few specimens only of timber construction now survive. Tewkesbury, Coventry, Salisbury, Shrewsbury, Exeter, are among the places where examples of this work still linger. In constructing corner houses with these timber-framed walls it became usual to employ a very strong corner-post of bent timber, and to carve it richly; and in some cases (as, for example, at one or two street-corners at Colchester), where the timber-framed wall has been replaced by a modern one of brick, the post has been still retained as an ornament.

Occasionally, especially late on in the Mediæval period, a dweller in a city secured a large plot of ground and erected a stately town house. In London, Crosby Hall, in Bishopsgate-street, alone remains to show a few traces of what such houses were. It was a splendid pile, erected by Sir Thomas Crosby, who died in 1475, and it was at one period the residence of the famous Sir Thomas More. This building, fortunately, escaped the fire of London, and its exterior is an interesting specimen of rich fifteenth-century domestic architecture, largely carried out in timber. Crosby Hall has fallen on evil days, and is now, alas! occupied as a great City dining-rooms, and has been varnished, painted, and done up in various ways with Modern Gothic, but still it is the best, almost the only, example of a Mediæval town-house of the first-class remaining in London. Some remains of Mediæval work also linger in the Deanery at Westminster and at Lambeth Palace, and some flavour of Mediæval character hangs about the Charterhouse.

For better, however, as a specimen of such a building is the Hôtel Cluny, at Paris, a place which every traveller goes to see, as it is the French South Kensington Museum. This is a town mansion of great beauty, kept up in a perfect state of repair, and filled with the finest examples of Mediæval furniture and curiosities.

The Hôtel Cluny* was built at the very end of the fifteenth century, and is in the French style of that period, a style often neither so dignified nor so regular as our own Perpendicular, but well and soberly treated in this example. The site is a large irregular plot, and the palace was set down so as to leave an entrance courtyard next the street, and a formal walled garden in the rear. The court is jealously shut in by a high wall, and when you pass the doorway you find facing you the principal building—three stories high, and with a rich octagonal turret staircase projecting from the front. A kind of open loggia on the left gives access, through an ante-room, to a range of four noble and very spacious rooms, opening out of each other. These, with two other adjoining ones, not *en suite* with them, form the state part of the house, and the same arrangement is repeated on the two upper floors. Detached from this block there are also a porter's lodge and a kitchen, and opening on to the garden there is a kind of vaulted open hall, over which, on the next floor, comes the chapel. Dignity, grace, and elegance combine well in this building, and the richly-carved chimney-pieces, with their fire-dogs, the panelled walls, and timber ceilings, the windows with their mullions and transomes and rich glass, and the fine floors laid in patterns, combine to give a great air of luxury to the interior. Famous as a more extensive and ambitious Mediæval house is one at Bourges, known as the House of Jacques Cœur,* of which illustrations are to be found in most books on the subject.

Of Mediæval towns some, in England, and a few in France, followed the lines both of the roads and walls of an earlier Roman town. The Romans always planned a fortified town (as they did their camps) four square, with a gate in the centre of each side and two main cross-roads cutting up the enclosed space into four equal squares. This description applies to Chester, to Dorchester, and to Colchester. In the first-named city the walls were rebuilt in Mediæval times, and remain perfect. In the other two the Roman walls were retained, and portions of them still exist. At Colchester there is even one of the Roman gates still standing. A Mediæval town was, however, usually irregular, with narrow, winding streets and many small houses crowded into the fortified enclosure whose outline had been dictated by the shape and levels of the ground rather than by convenience. The finest existing example of such a town is Carcassone, in the South of France, where the fortifications still remain as perfect as in the fourteenth century. Not so far off from England, and but little more modernised, is Mont St. Michel, on the coast of Normandy, probably the most picturesque spot in Europe, and like Carcassonne in retaining its fortifications. I do not think I can point to any English city quite parallel to these, though the older streets of several of our cathedral towns are not unlike bits of them.

Perhaps the best idea of what a Mediæval town looked like which we can get in England is obtained by visiting Chester. Here the fortifications remain; most of the houses have gables to the street, and many of them have ornamental woodwork, while a most picturesque and unusual arrangement of footpaths two storeys in height gives a great air of quaintness to the streets. It is true that almost all these buildings date from a period later than the Mediæval time, but they have been rebuilt one by one as necessity arose. Most of them retain their gables, with barge boards and overhanging upper stories, and even the most recent have been built with care and taste, so that the antique flavour has not been entirely lost.

In the Middle Ages there were also a few brand-new towns established, just as Alexander the Great set up Alexandria on an absolutely new site, and laid out with formal exactness. During the English occupation of a large part of France, Edward I. founded several such towns, as, for example, Libourne on the Gironde, not very far from Bordeaux, and Montpazier. Winchelsea was a new-built town, founded also by Edward I., and was extremely regular in its plan, though not quite so formal as Libourne.

Houses in the Country.

When we pass from town to country we find ourselves on more familiar ground, the examples—especially the English examples—are more numerous, in better preservation, and more interesting. They chiefly, however, date from the fifteenth century or later, and as it is not possible to go very far into dates and differences, I will ask you to bear in mind generally that the later in date the example, the more complete, but also the more complicated will its arrangements be; that the earliest houses, so far as they can be found, are those that exhibit the essential features of an English country house in their bare simplicity, and that each century witnessed a large increase in domestic comfort and even luxury in the extent of the buildings erected.

The distinctive feature,—the one apartment *essential* to an English country house,—was the hall. In that delightful poem in prose and verse, "The Wolfings," Mr. Morris has drawn a picture of some primitive clan apparently akin to our Saxon ancestors, whose great hall was at once their pride and their place of meeting, feasting, and living, and so it was in our own land.

Probably in this country there once were houses which were literally a hall and nothing else. In very remote days, cooking took place at a fire on the hearth in the middle of the floor, and the hall was sometimes the place where it was done, while it then, and long afterwards, served as the living-room and sleeping-chamber of most of the folk. Two other rooms at least were, however, generally met with, even in remote times, and always in days of comfort. One was the kitchen, the other the solar or parlour, a room which afforded some retreat for the lord, or his family, from the noise and drunken revelry which, I fear, was only too prevalent in the hall.

The hall was always spacious and lofty in proportion to the general run of the house. It usually had an open roof, and the framework of the roof was often richly moulded and ornamented. A portion of the floor at the upper end of the room was slightly raised and was called the daïs. On this was a mighty oak table with benches, at which sat the lord and his family and guests; the retainers, servants, and others dined below the daïs. There was often a grand bay-window in the hall, which usually was at the end where the daïs occurs. There was always a fire, either on a hearth on the floor or in a fireplace at the side of the hall. There was very often a gallery, in which at festivities musicians could be stationed. This generally crossed the lower end of the hall, and at that end there was (usually under this gallery) a passage carried from side to side, often behind a screen. Before the music gallery became common the division between the passage and the hall was usually carried up to the roof of the hall, and there was often a wide arched opening in the centre of it, the whole stoutly formed of timber. To the sides of this opening the name of "the speeres" is given.

This national feature extended from private to corporate and public buildings. The halls of the principal colleges at Oxford and Cambridge, those of Hampton Court, Windsor, and Eltham palaces, are and were fine and large structures; so are those of the Inns of Court, among which the notable Middle Temple hall is pre-eminent. All these lead us up to Westminster Hall, with its great hammer-beam roof, unrivalled in Europe.

Next the daïs, and usually immediately behind the hall and up a few steps, was the solar or parlour. This apartment had more comfort than the hall must often have afforded. A very fine example of the solar is the Jerusalem Chamber of the Deanery at Westminster, which is the solar—as the boys' dining hall is the hall, of the house of the Abbot of Westminster. Below the floor of the solar was usually the cellar. Near the lower end of the hall but separated from it by the passage already alluded to, was the kitchen, with, in a large house, sundry pantries, larders, and store-places, and a buttery hatch, from which provisions were given out. A Mediæval kitchen is often vaulted, and almost always a noble room with a vast fireplace.

In addition to these three rooms most houses contained some other rooms for service and for sleeping, but the amount of accommodation varied, and, in most cases, such extra rooms were added on at a later date as required.

In many cases the house was protected by a moat, that is to say, an artificial deep ditch, some 10 ft. or 12 ft. wide, and full of water, and was approached by a drawbridge. It was usual (I think invariable) to arrange a moated house as a square block, with a quadrangle in the centre, and other houses were not infrequently

* Illustrated Viollet-le-Duc, "Dict.," arts. Pan de Bois and Maison.

* Illustrated in Viollet-le-Duc, "Dict.," Art. Maison.

so planned, or were made to take the shape of three sides of a square, but in this respect practice varied.

Wardley Hall, near Worsley, in Lancashire,* is a good example of a moated manor house. It is a quadrangle, singularly irregular in shape, owing, apparently, to the irregular shape of the land enclosed by the moat. Wardley Hall is believed to have been built in the time of Henry VI., 1422-1460, that is to say, the middle of the fifteenth century, and to have been originally wholly of half-timbered construction, though it has been altered and, to some extent, defaced in later times. There is a gate-house at the north side of the quadrangle, in front of which used to be a drawbridge. Part of the gate-house was used as the chapel. The south side is occupied by a hall, about 40 ft. by 21 ft., with bay and great fireplace and passage. The east wing is the servants' wing, and contained the kitchen and dependencies; the west wing is the family wing, with solar or dining-room and withdrawing-room. The wings and gate-house were of two stories. The present staircase is of the seventeenth century,—it probably replaces an earlier one of smaller size. The chimneys are of brick.

Many country houses were, to some extent, fortified, and, even if they had not the protection of a moat, were made strong enough to resist the attack of a party of freebooters, at a time when gunpowder was not yet known. It was requisite to get a licence from the Crown before you added battlements and such-like military features to your house, and the licences to crenellate, as they are called, still exist among the public records, and are often of great value in fixing the date of the erection of a house.†

THE ARCHITECTURAL ASSOCIATION VISITS:

THE NEW HOSPITAL FOR WOMEN.

This latest addition to the hospitals of the metropolis, which is now being completed from the designs of Mr. J. M. Brydon, in the Euston-road, was visited on Saturday afternoon by a party of members of the Architectural Association, under the guidance of the architect.

The staff of this institution for the treatment of diseases of women and children will be composed entirely of women, and attached to the hospital a small number of lady students will receive a medical training, which many of them will put into practice in the zenana of India, from which medical men are so rigidly excluded.

The building, in comparison with other metropolitan hospitals, may be termed a small one, but efforts have been made to make the arrangements as complete and perfect as possible.

The site of the building is extensive, and will, probably, in due course, be bounded on the west by a new street. Part of the site will be laid out as gardens for the use of the patients.

The group of buildings consists of three blocks, a rectangular ward block, another rectangular administrative block with a circular ward block behind it.

The ground-floor of the front block is occupied by a library for students, and a large entrance-hall. Rectangular wards occupy the two floors above, and nurses' bedrooms the uppermost floor.

The administrative block has the drug, convalescent, and consulting rooms, with out-patients' waiting-rooms conveniently arranged, whilst the nurses' rooms and the kitchen are on the upper floors.

The arrangements for heating and ventilating the wards and the rest of the building have been carefully planned. Fresh, warm air is introduced through the stoves, which occupy a central position in both circular and rectangular wards, and through the hot-water coils placed under the windows, whilst extract ventilators, with Bunsen burners, are provided to carry off the vitiated air.

The floors of the wards are of fireproof construction, and covered with carefully-laid wood-block flooring.

The arrangement of the light which pervades all parts of this building cannot be too highly praised. The building seems well suited to meet the requirements, for which it has been carefully designed from a utilitarian standpoint.

* Illustrated in Henry Taylor's "Old Halls of Lancashire and Cheshire."

† The conclusion in our next.

Sketch-Design for a Sun-dial: by M. Armbruster.

SKETCH DESIGN FOR A SUNDIAL.

It was mentioned in our "Letter from Paris" of February 1 that the subject of a "cadran solaire" had been set for the students' competition in decorative design at the École des Beaux-Arts, and M. Armbruster's design had been awarded the prize. The accompanying illustration is reproduced from a photograph taken from the clay model of this design submitted in the competition. The design is for a wall-dial, surmounted by a figure of Time, and flanked by figures of Day and Night.

The Lock-out of Kentish Brickmakers. Saturday last completed the fourth week of the strike of the Kentish bargemen, while on the same day the brickmakers, locked-out in consequence of the bargemen's strike, completed their third week of enforced idleness. According to the *South Eastern Gazette*, the trade of Sittingbourne and district is slowly but surely drifting away, and probably will never be regained. The brickmasters take a very gloomy view of the situation, and argue, with some truth, that the brick industry will never be what it has been. The action of the Kentish bargemen has been suicidal, so far as the interests of the brickmaking districts are concerned, for not only will many fields which found employment for a large number of hands be closed, but employers in some instances are seriously contemplating retiring from business altogether. This will compel many men to remove from the district, and the prosperity of the place must consequently decline. Subscriptions for relief of distress amongst the brickmakers are being received at Sittingbourne by the Central Relief Committee, of which the Rev. Henry Venn, vicar of Sittingbourne, is chairman, and Mr. G. F. Evans treasurer.

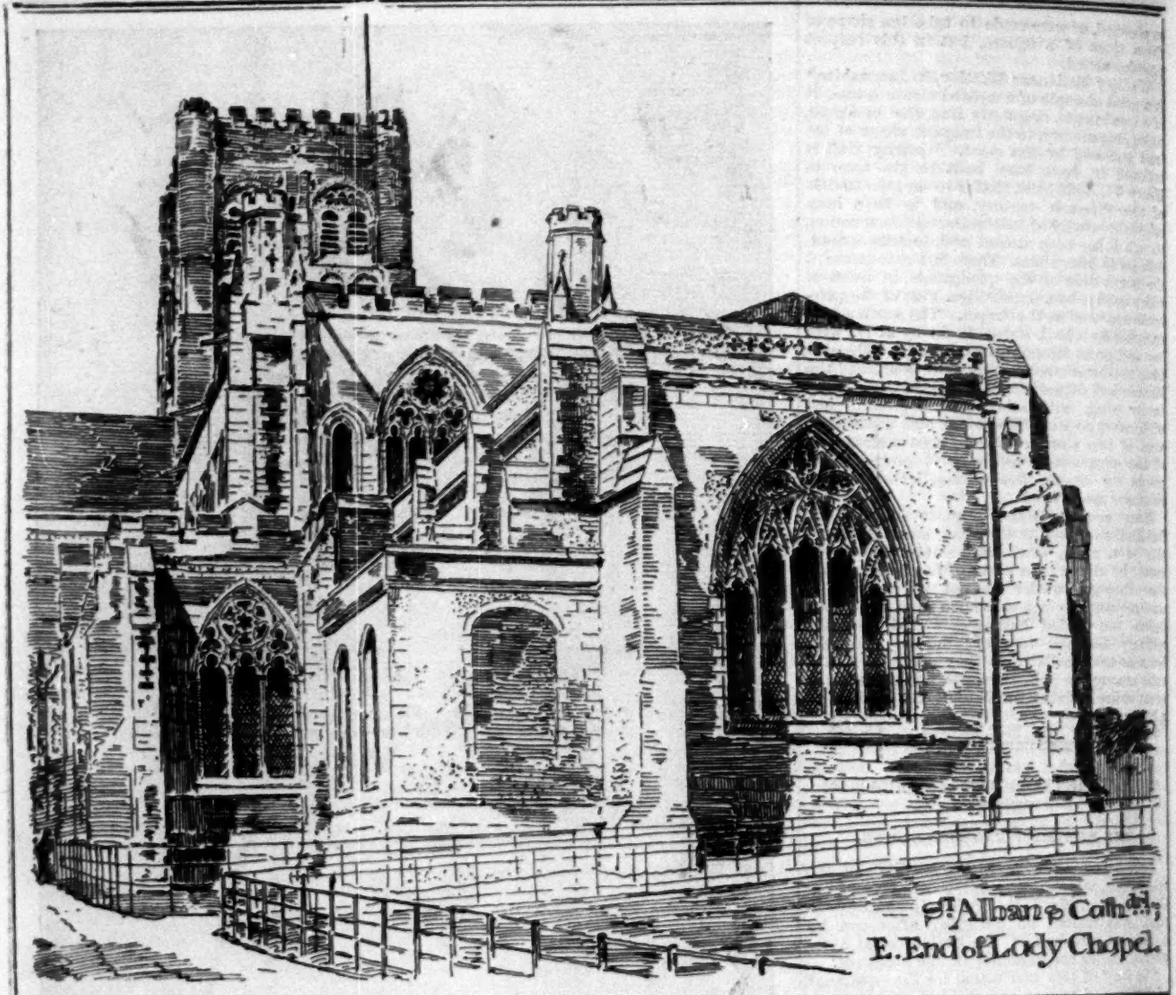
Illustrations.

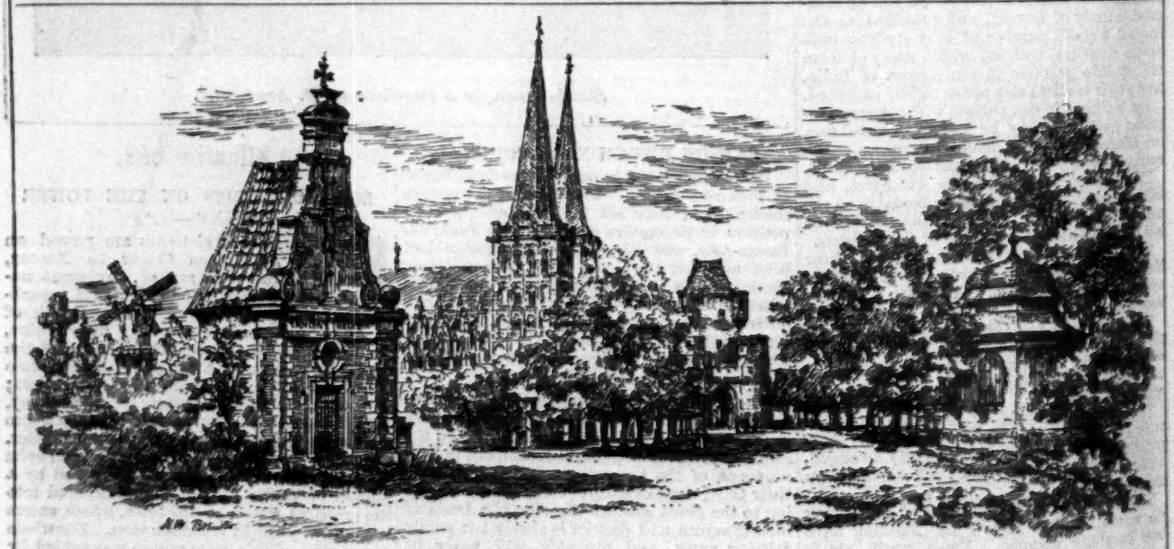
SOME CHURCHES ON THE LOWER RHINE.—II.*

Several old churches are passed on the road from Calcar to Xanten, but they are not of any great importance. The approach to Xanten is remarkably picturesque, and we give a sketch of it. By the roadside is a pretty little shrine, containing an altar dating from the end of the seventeenth century; a fine old windmill; some singular clipped trees are seen to the left; whereas a fourteenth-century brick gateway, with its barbican, is seen to the right; and above all rise the spires and lofty roof of the Minster.

Passing through the old gateway, which upon nearer approach is seen to be adorned by a number of carved shields, one is admitted into the principal street of the town, which enters the market-place by a sudden turn. The whole of one side of this great square is occupied by ecclesiastical buildings. The first object which attracts attention is the Protestant church, a small seventeenth-century building with a rather picturesque octagonal bell tower. Close to it is another small church or chapel, dedicated to St. Michael, the nave of which is above a gateway. It is a very pretty little building, with an elegant octagonal turret, the nave Romanesque, and the apse fourteenth century work; it is now used as a school. Rising over these two small churches are seen the great Romanesque towers of the Minster church of Saint Victor, crowned by two lofty slate spires, the long roof-line of the nave, and the grand range of pinnacles and flying buttresses.

* See *Builder* for March 8 last, p. 173.





Outside Xanten Gateway.

Passing under the archway beneath the little church of St. Michael, one is admitted into the churchyard of the Minster. Immediately facing us is the very rich south doorway and the extended flank of that beautiful building, with its rich pierced flying buttresses, elaborate groups of pinnacles, and elegant traceried windows. To our right is a fine representation of the Crucifixion, composed of a group of statues, larger than life, carved in stone, dated 1530. Immediately to the left is the picturesque porch and stairway leading up to St. Michael's Chapel, and scattered about are various vaulted shrines, containing representations of Our Lord's Passion. Passing on to the left one comes in front of the west-end of the church, flanked by Romanesque towers, and adornep with arcade work. It is, however, rather a flat and bald composition.

On the north side of the Minster is a very beautiful set of cloisters, surrounded by the old buildings formerly inhabited by the canons and other members of the Chapter before the ecclesiastical establishment was suppressed; in the centre of the sarth is a most exquisite cross. The walls of the cloisters are covered with tablets, memorials, and inscriptions of every date, some of them undoubtedly Roman. I should mention the fact that Xanten was one of the most important Roman stations in Germany. The remains of an amphitheatre and other works are still to be seen close to the town. Altars, cinerary urns, coins, &c., are discovered in every direction. There is an interesting collection of such antiquities in the Town-hall. From the cloisters, the noble flying buttresses of the north side of the church are well seen. The chapter-house is a fine apartment with a row of slender octagonal columns supporting the vaulting; it is full of ancient vestments, dating from the eleventh to the seventeenth centuries, hangings, altar frontals, &c.

WINDOW IN APSE, RANMOOR CHURCH, SHEFFIELD.

By Messrs Shrigley & Hunt.

WINDOW IN APSE, RANMOOR CHURCH, SHEFFIELD.

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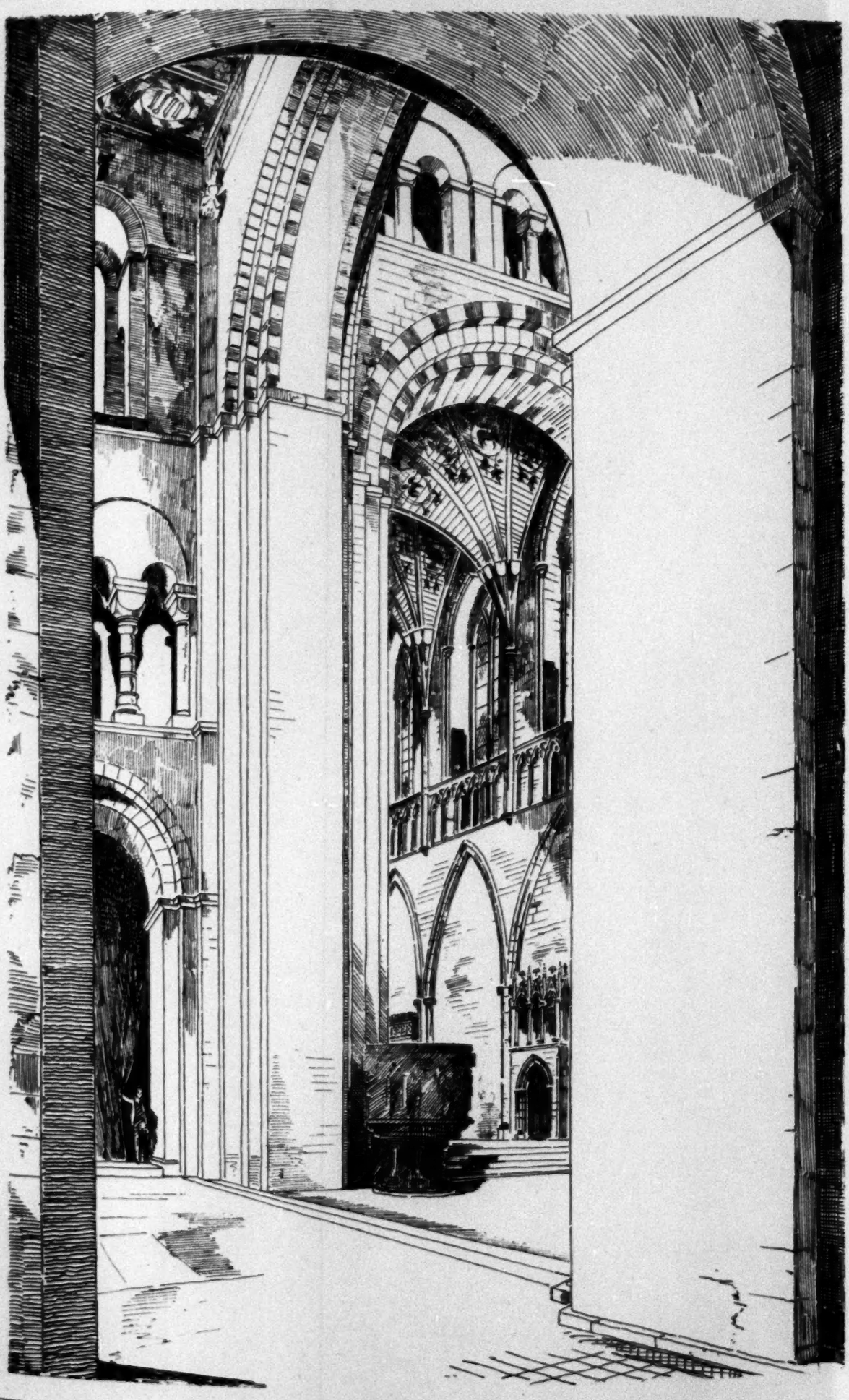
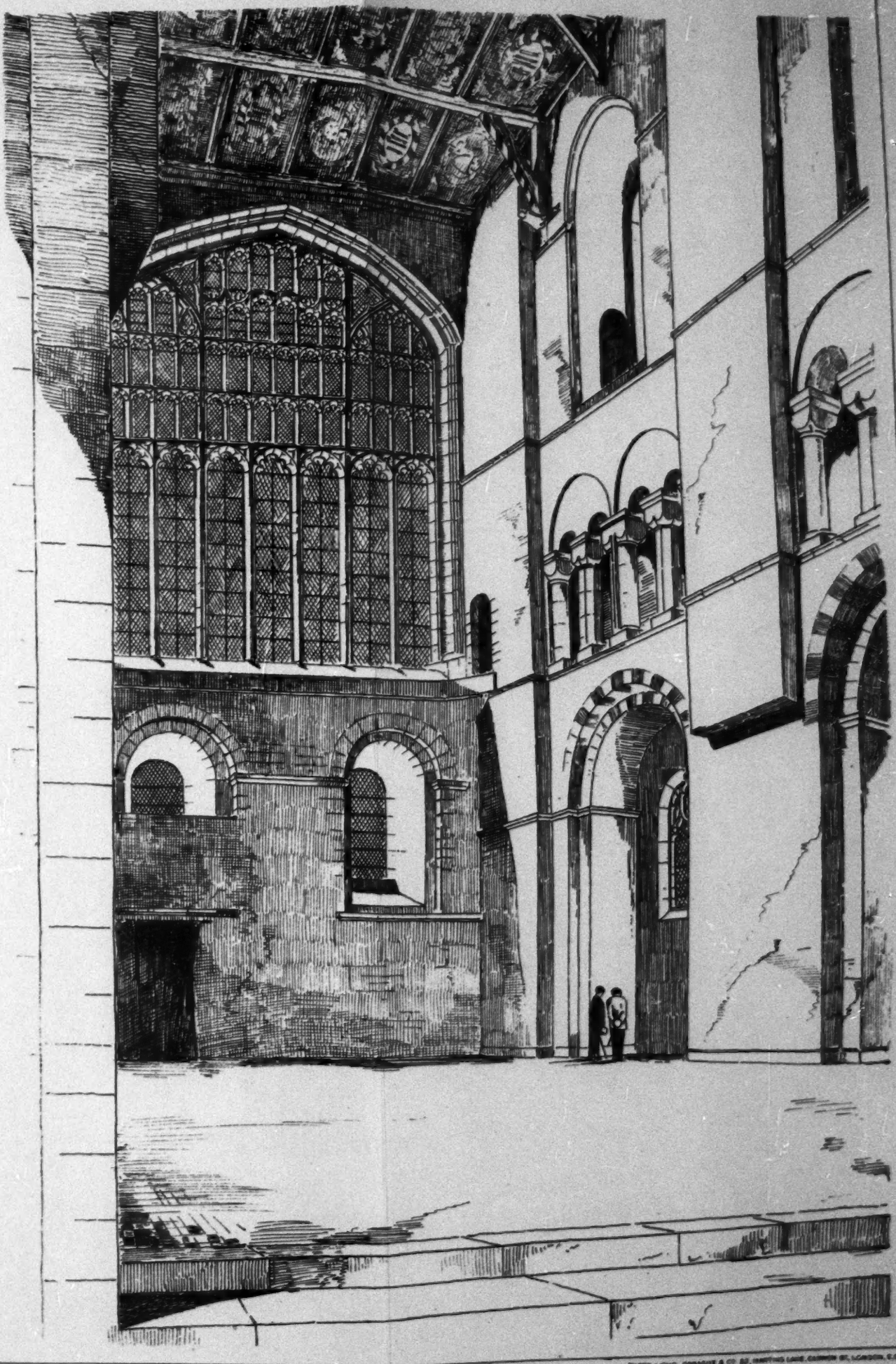
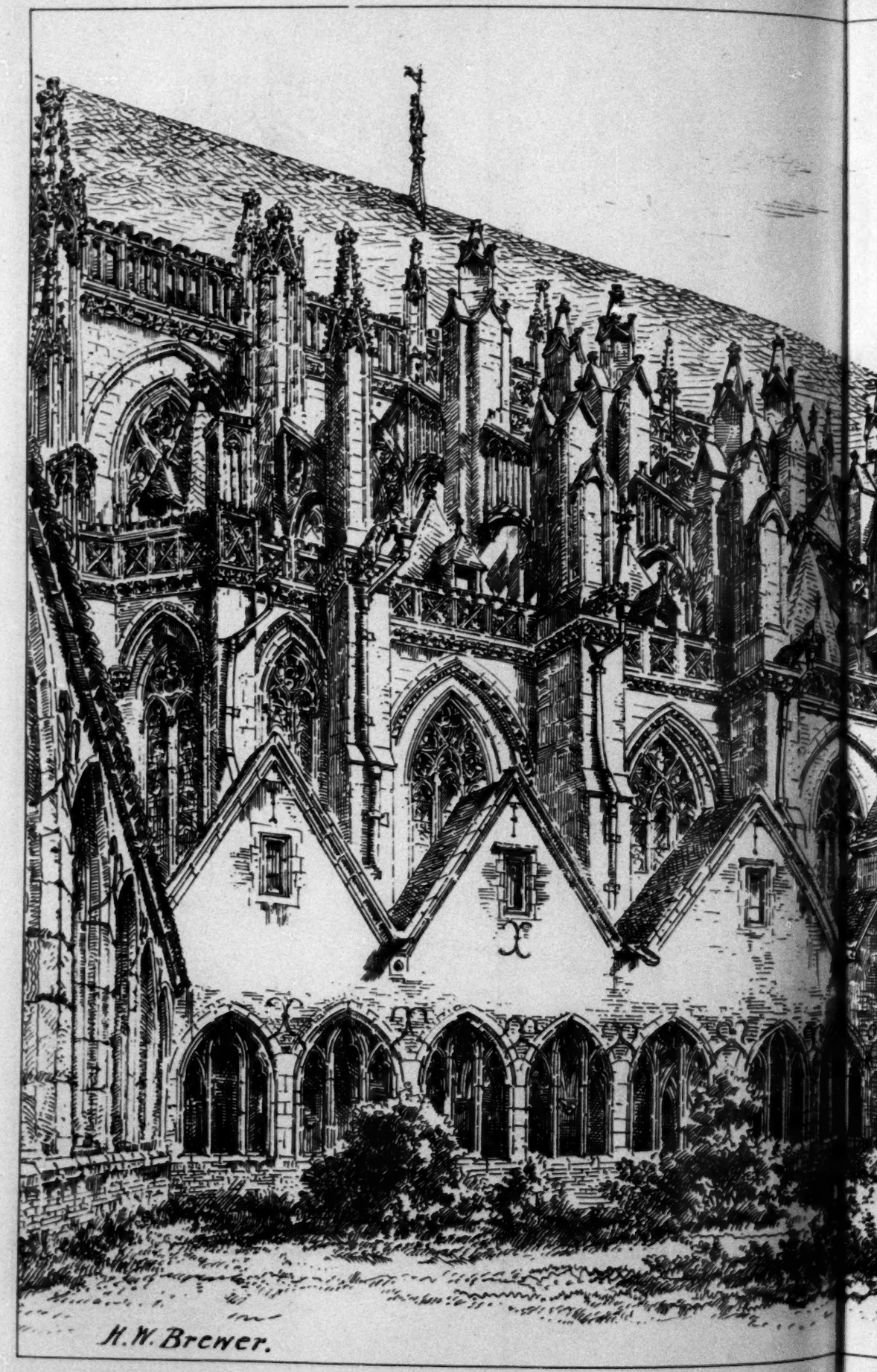


VIEW OF CHOIR FROM NORTH TRANSEPT.



INTERIOR OF THE NORTH TRANSEPT, BEFORE "RESTORATION."

ALBAN'S CATHEDRAL.



H. W. Brewer.

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VIEW FROM THE CLOIS

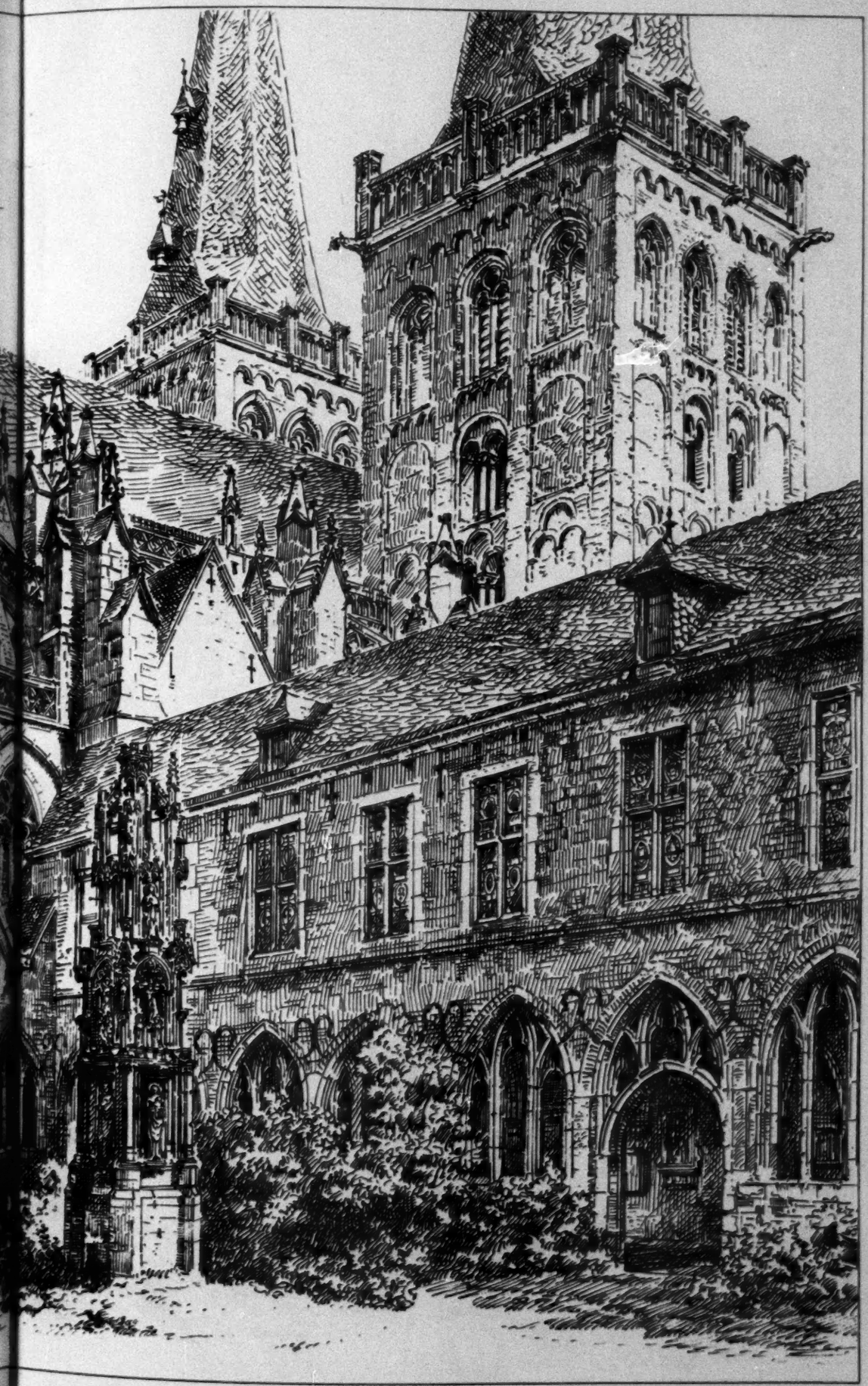

PHOTO-LITHO. EMMOTT & CO. 33, MARTINS LANE, CANNON ST. LONDON, E.C.

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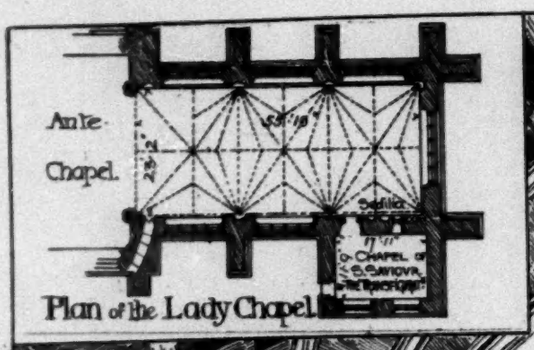


Plan of the Lady Chapel.

GENERAL VIEW LOOKING N.E.

St. Alban's Cathedral: Interior of the Lady Chapel

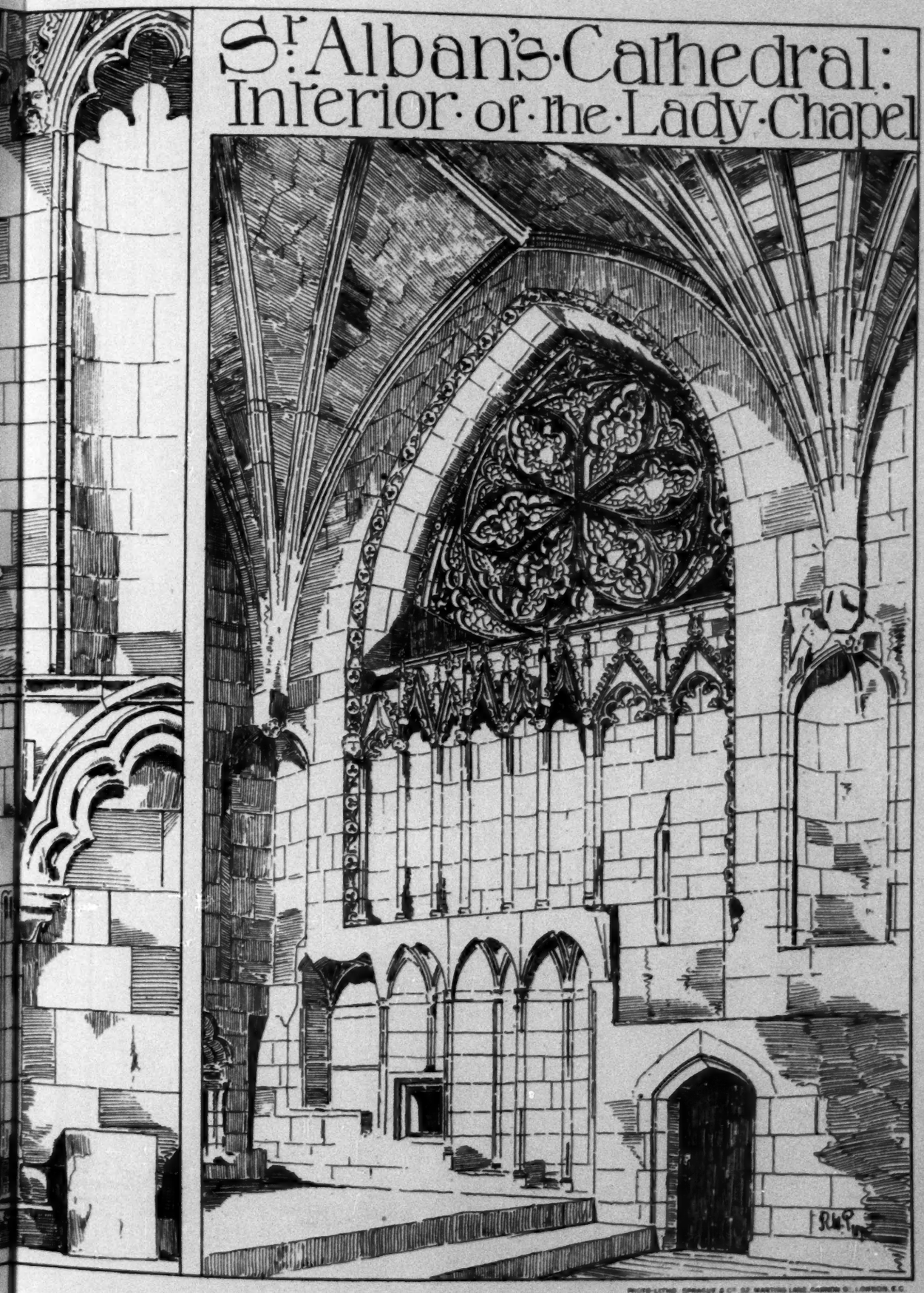
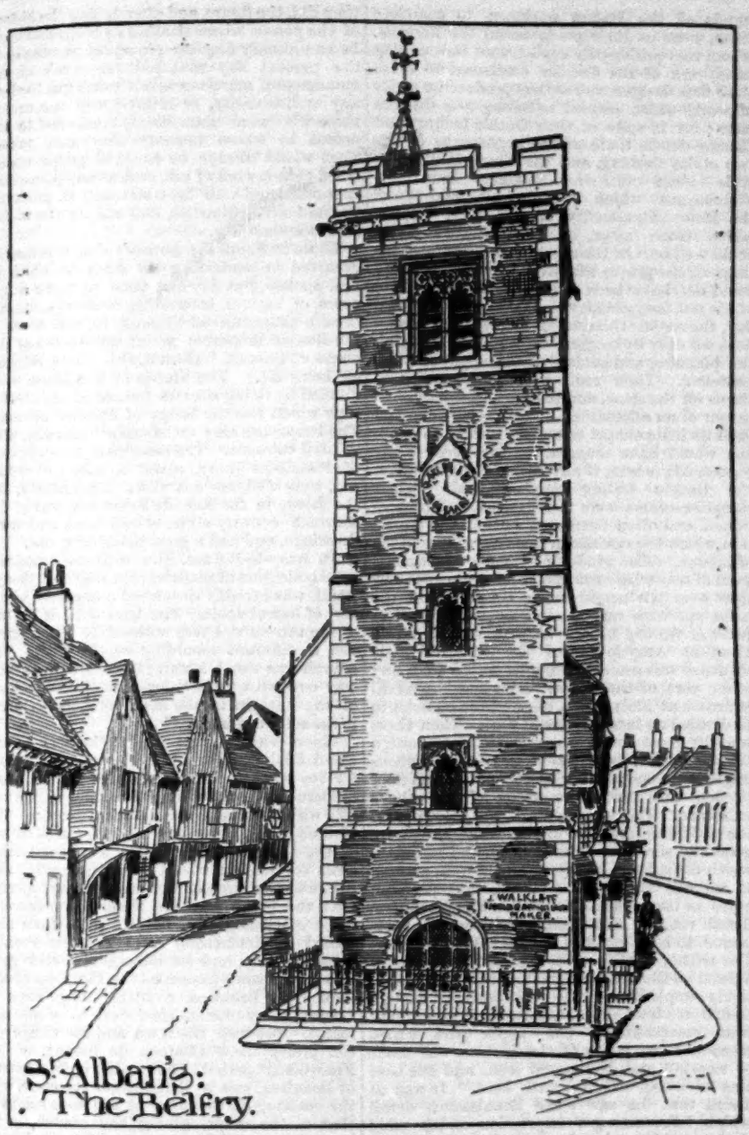


PHOTO-LITHO SPRAGUE & Co., 52 MARTINS LANE, CANNON ST., LONDON, E.C.

THE S.E. ANGLE.



St. Alban's: The Belfry.

most remarkable collection of ancient embroidery.

As will be noticed at once, the western portion of the church, including the two great towers, is Romanesque, but the nave and choir are very rich, thoroughly-developed Gothic work. It is said that the choir was commenced in 1263, and that the nave is at least a century later. The building has very little in common with the general run of North German churches, but bears a greater resemblance to the much richer ones of South Germany. In fact, the resemblance to Ratisbon Cathedral is so remarkable that it is not improbable that they may be works of the same architect. It would occupy too much space here to discuss this question. We reserve more detailed description of the building, its noble interior, and most interesting contents, for a future article.

H. W. B.

ST. ALBAN'S CATHEDRAL.

The interior views of St. Alban's Cathedral, which are given to-day, show the original work in the north transept and choir before Lord Grimthorpe's recent restoration (?), and also the present condition of the Lady-chapel, which is so far untouched, but which will doubtless be dealt with shortly under the faculty granted to Lord Grimthorpe not many weeks ago. The interior of the north transept gives Abbot Wheathampstead's window of seven lights, of the same pattern as those formerly at the west end of the nave and in the south transept. All have now been swept away, the one shown having given place to an enormous rose window which even unscales the solid Norman work near it. The old flat painted ceiling, which had a curious representation of the martyrdom of St. Alban in the centre, has also disappeared, and a plain ceiling has been substituted. In the arched recesses of the transept, on its eastern side, are an interesting series of encaustic and embossed tiles.

The only alteration, so far, made in the choir—a portion of which is shown in the view from the north transept—is the substitution of three-light Geometrical windows for the original three lancets under an enclosing arch. The beautiful window over the east end of the presbytery, which shows in the view of the exterior, has also been taken down, and a new one put in its place.

The Lady-chapel, which remains in an unrestored state, is illustrated by two views—one a general view taken from the ante-chapel, and a portion of the south-east angle with the Sedilia.

As will be seen by the general view, the chapel is of two dates. Up to the cill level it is Early English work, with arcading trefoiled on the north side, and cinquefoiled on the south. Over this, all is of Decorated date, the work of Abbot Eversden, 1308-1326, who also built the ante-chapel between this and the presbytery. The Lady-chapel fared badly during the period of its use as a school, the old arcading and the canopied niches having been cut down to accommodate the panelling, and a good many of the statues being destroyed. The chapel proper is of three bays, each with a four-light Decorated window. At the east end is a five-light window curiously designed, the principal lights being surmounted both inside and out by crocketed gables with finials. On the south side are the remains of some gorgeous sedilia, with a row of canopied niches, and a triangular window over. Projecting south at this point is a vestry, formerly the Chapel of Saint Saviour, and of Late Perpendicular date.

The vaulting of the chapel is of wood with stone springers. On the splays and central mullions of the side windows are little canopied niches with figures of bishops, and rows of ball-flower ornaments occur both at the inside angle of the splay and against the window tracery. Clunch has been largely used in the interior and Tottenhoe stone outside, together with flint and brickwork. The buttresses and mouldings of the exterior generally have become much worn, and much of the detail has entirely disappeared.

The belfry-tower or "clock house," a sketch of which is subjoined, is in the market-place, immediately north of the Abbey; and, according to Clutterbuck, there are deeds showing that it was built 1402-27. Near it was formerly one of the Eleanor crosses, destroyed in 1702.

WINDOW, RANMOOR CHURCH, SHEFFIELD.

The subject of this window, which is placed in the apse of Ranmoor Church, near Sheffield, is the Resurrection. The principal figures are in toned white draperies relieved against the dark background formed by the rich colour of the foliage and rocks. The angels have ruby wings, and this colour is repeated in the dexter light in the cross upon the banner and in the nimbus around the head of Our Lord. The sleeping soldiers at the base are clad in brasen armour, which is subdued and in pleasant harmony of colour with the pearly tones of the tomb.

The window is by Messrs. Shrigley & Hunt, and the drawing from which the illustration is taken was exhibited at last year's Royal Academy.

THE ARCHITECTURAL ASSOCIATION:

NOTES BY THE A.A. TRAVELLING STUDENT.

At the ordinary fortnightly meeting of this Association, held on Friday, the 28th ult., Mr. Leonard Stokes, President, in the chair,

Mr. E. S. Gale (hon. sec.) moved a vote of thanks to Mr. Norman Shaw, R.A., for receiving the members on the occasion of their visit to the new headquarters for the Metropolitan Police on the Victoria Embankment, on the 21st ult.

Messrs. F. E. Bristowe and F. W. Bryan were then elected members of the Association.

The Chairman then submitted to the meeting the committee's "house-list" of members proposed for officers and committee for next session, but it was open to any member to make other nominations for any of the offices up to that day four weeks. We may mention that the "house-list" nominates Mr. Stokes for re-election as President, and Messrs. F. R. Farrow and E. S. Gale for re-election as honorary secretaries.

Mr. A. E. Bartlett, holder of the Architectural Association Travelling Studentship for 1889, then read a paper, entitled, "An Account of a Tour in France, chiefly in the Loire Valley." The tour extended over a period of seven weeks, and the author left London on July 1, carrying with him an ample supply of sketching-paper, lining-paper for full-size details, and scale-paper for measured drawings. After a short stay of four days at Rouen (to which city he returned and spent a fortnight there at the end of his tour), he went to Chartres, and there he wandered about the cathedral some time before he could make up his mind what to set to work upon. The place was so colossal, and its details were so much in keeping with its grandeur, that it seemed useless, in the short time at his disposal, to attempt to measure any of the actual cathedral work, so he contented himself with making sketches about the place, and with measuring one or two details. The first thing that struck him on seeing the Cathedral of Chartres under a blazing July sun was the glorious effect of colour given by the bright green copper roof which topped the rich brownish-grey walls. The roof was skilfully constructed of iron, and was a comparatively new addition, to replace the old lead-covered wooden roof which was destroyed by fire

in 1836, and which, by reason of the multitude of its timbers, was known by the name of "the forest." The inside of the present roof was worth a visit, if only to see how little the vaulting had to do with the construction of the roof, the tie-rods of which came several feet above the cement finishing of the vaulting. It seemed rather a wasteful piece of construction, though it was undoubtedly effective. It showed us that constructive shams, for the sake of artistic effect, were not confined to one age or one style. Chartres seemed fated to suffer from fire. Five successive times before the present church was built was the cathedral burned to the ground, and on one occasion the greater part of the town was involved in the catastrophe. The graceful tower which stood at the north-west angle was designed by Jean Texier in 1506 to replace another which had been burned down. Though of so late a date, it showed little Renaissance feeling, except in some of the panels near the top. M. Durand, in his excellent monograph of Chartres, gave an interesting account of the building of the cathedral which stood here before the present one, and which was burnt down in 1174, and he quoted a letter from Hugh, Archbishop of Rouen at that time, who narrated that the clergy, holding High Mass in their ruined church, kindled in the neighbouring countryfolk a keen interest in its rebuilding; and he told how, by reason of certain miracles, performed on the sick, who were brought to the church, the interest afterwards grew till the whole countryside was in a fever of religious enthusiasm, and men, forming themselves into brotherhoods, loaded their carts with stone, wood, lime, and victuals for the workmen, and yoking themselves to them, set out on a pilgrimage to Chartres, to help forward the building of the church. So great were their loads, he told us, that sometimes it took a thousand men to drag one cart! Such was the account given by Archbishop Hugh of the building of the Cathedral of Chartres in 1037. The existing cathedral as we now saw it was begun in the year 1194, in the reign of Philip Augustus and the episcopate of Regnault de Monçon, and was consecrated on the 17th of October, 1260, as some said in the presence of St. Louis himself. He (Mr. Bartlett) could do no more than mention the rose windows, the stained glass, the excellent sculptures, the marvellous Renaissance screen running round the choir (which Fergusson compared to point-lace in stone), the intricate labyrinth marked out in black marble on the floor of the nave (over which in days gone by penitents used to crawl on their knees, saying a prayer at each turn), or the Black Virgin, the most precious treasure of the Cathedral, and which the mob of the Revolution crowned with a red cap of liberty, but did not dare to destroy. Except one small house in the Rue du Grand Cerf, there was not much good domestic work in the town. There was, however, a curious little Renaissance clock tower on the north side of the Cathedral, the cornice of which was almost exactly the same as the cornice on the main entrance front at the Château of Chenonceaux. Another detail worth noticing was the little cast-iron fountain in the market-place, which was a very excellent little design.

At Le Mans, one thing to be specially noted was the extreme care with which the Mediæval builders chose their sites, taking that part for their church which seemed left by nature as the site best fitted for the noblest building, and letting the other buildings of the town group round it as they would. The great choir towered high above the surrounding town, with a broad flight of steps leading up to the level of the floor of the church. If the builders of the choir had pulled down and rebuilt the nave in accord with it, the Cathedral of Le Mans would probably be about the largest in France. As it stood, the nave was an interesting archæological study, the caps of some of the columns in the nave showing their Classic origin in a very marked manner. There was a very good piece of colour decoration in the apse, and a very nice piece of domestic work at the west end of the cathedral.

The author's next stopping-place was Tours, in the very centre of all the great works of the François Premier period, and whence he visited Azay-le-Rideau, Loches, Beaulieu, Chenonceaux, Amboise, and Blois, and got his first impressions of the works of the French Renaissance. The early builders of the French Renaissance seemed to have used their own brains in devising their houses, and to have employed the skilful hands of the Italian workmen to complete them, even as their predecessors the Romans, whom they professedly copied, used the cunning handiwork of the Grecian craftsmen to dress their own designs, and so they produced a series of works which seemed to belong to a distinct class; for in spite of their Gothic feeling and Classic detail, there was no appearance of the two styles clashing, and the François Premier style itself was as distinct from the Flamboyant which preceded it, and from the heavy Classicality of the Henri Quatre, which came after, as two adjacent styles could well be. As the requirements and occupations of the people who lived in these châteaux could not have been very different from those of the ordinary country gentleman of our own day, the author thought we might learn a good deal, not only by bagging detail, but by studying the planning and general arrangement of those châteaux. Their roofs were steep-pitched to throw off the snow, and so high sometimes as to savour of an affectation. Nearly every one had each its little chapel or oratory (often too small, one would have thought, for the needs of the household), where, if anywhere in the building, the Gothic feeling predominated. Their reception-rooms were stately and well-proportioned, and often decorated with carved panels into which the craftsman must have put months of labour. The windows of these apartments were of course so arranged as to gain some fair view over the neighbouring country, and the main staircase was treated as an important feature, worthy of the highest consideration. Thus at Azay-le-Rideau the beautiful little staircase was more lavishly decorated than any other part of the house. The great external staircase at Blois, again, allowed the château to be divided up into a series of flats. Then there was the great double staircase at Chambord, a curious device, by means of which two persons might pass one another on their way from floor to floor and neither be aware of the other's existence. The treatment of the balconies of the châteaux, and the way in which they were generally screened from the rain and sun, were worth attention. Every detail, in fact, pointed to an age almost as civilised, and, perhaps, quite as luxurious as our own. There was one detail, viz., the lead finial, which seemed at this period to have reached its highest excellence. The author exhibited the measured drawing of a finial at Blois, a very good one of a comparatively simple kind. He was fortunate enough to find it blown down, otherwise it would have been inaccessible. The upper part, which resembled the flower of the fuchsia, was made of wrought and hammered iron, and the base was of wood, covered with lead. It was at Tours that he saw some Renaissance detail which left a stronger impression on his mind than anything else he saw during his trip. In a chapel at the south transept of the cathedral, stood the beautiful monument of the two children of Charles VIII. and Anne of Brittany. The two children, watched over by four angels, all carved in white marble, lie on a black marble slab, underneath which was a white marble sarcophagus decorated with the arms of France and somewhat weak cherubs; the angles of the tomb were marked by dolphins and conventional eagle's wings. Along the upper portion of the sarcophagus were carved scenes from Bible history, most of which seemed to be illustrations of the exploits of Samson, conventionalised for decorative purposes. The monument was hacked to pieces by some of the furies of the Revolution, but it was restored as far as possible in 1815. It was the work of two brothers, natives of Tours, named Juste, who were contemporaries of Jean Goujon, and, in spite of a few faults of detail, it was an extremely beautiful and appropriate monument. Another monument which the author saw during his tour was the beautiful tomb of Agnes Sorel, the favourite of Charles VII., which stood in a tiny chapel in the stern castle of Loches. The general idea of the tomb was much the same as that of the one just described. The beautiful figure of the "Belle of Belles" lay, carved in white limestone, on a slab of black marble, with two angels at her head and two lambs at her feet. The effigy was a splendid piece of work, and the tomb was a lesson both to the sculptor and architect. Unlike the one at Tours, the body of the tomb was simple and devoid of ornament, which was, perhaps, an advantage, as it concentrated the attention on the beautiful figure at the top. It was a monument to be seen and remembered. Tombs such as these served a distinct purpose, recalling, as they did, the figure, and often telling the history of the person whose death they commemorated. In an ordinary English graveyard the tombs of the present day savoured too much of the monumental marble-mason's catalogue to show any individuality, or interest any one except those who were immediately concerned in the person to whose memory they were raised. That would always be so until people understood that a work of art, such as any permanent memorial ought to be, could only be produced by the individual artist, and not by the wholesale manufacturer.

While in Tours the author's time was mainly occupied in measuring the tomb of which he had spoken, but he had time to make a few notes of various interesting buildings, among them a charming old fifteenth-century house in the Rue de Briçonnet which was known as the house of Tristan L'Hermit, the Prime Minister of Louis XI. The stories of the house were divided by string courses formed of the knotted rope which was the badge of Anne of Brittany. The house has also an excellent doorway, with twisted columns. The remains of the old castle of Plessis-les-Tours, about a mile and a-half out, were well worth a visit. The château, like the house in the Rue de Briçonnet, was in the fifteenth century style, of red brick and stone dressings, and had a good newel staircase.

At Azay-le-Rideau, the château contains a good collection of pictures; the staircase, though small, was lavishly decorated and ceiled with a sort of barrel vault. The lead work at the top of the turrets was very noticeable. Each turret had a different moulding at the base. The church was worth a visit; it had a curious doorway covered with a three-centred arch. Many of the cottages in the neighbourhood were cut in the solid sandstone.

There was a great deal to be seen in and about Lôches. The château was more famous for its terrible dungeons than for the more modern group of buildings standing a little way off which formed the château proper. The Church of St. Ours was built in the latter end of the twelfth century. Its four cone-shaped roofs formed an effective and interesting skyline, and the circular western doorway, opening from the porch into the nave, was a splendid piece of Romanesque detail. The town contained a picturesque little François Premier Hôtel de Ville, and an interesting Gothic gateway to the town known as the Porte des Cordeliers. At Beaulieu, a little village close by Lôches, there was a good deal to be seen and learnt. Between the town and the village was the pretty little Château de Saussc, of the François 1er period. The Church of St. Laurent, at Beaulieu, was a Romanesque structure, with the vaulting of the aisles of the same height as that of the choir, giving the church, in its present state of dilapidation and neglect, more the appearance of a large hall than that of a church. In this village also were the remains of the Église des Moines, which was formerly attached to a Benedictine convent; all that was now left of it was the tall, graceful western steeple and the lofty choir, which had been carefully restored, and was now used for services. The rest of the church was destroyed by the English in 1412.

The author's next stopping-place was Chenonceaux, with its famous little château built on a bridge spanning the river. At one time it belonged to Diana of Poictiers. On the death of Henry II. it was enlarged by Catherine de Medicis, who took up her abode there. Last year the château was bought by a French financial company, the Crédit de Paris, and its future was somewhat uncertain. In the long gallery were a couple of fireplaces, said to be by Philibert de l'Orme, but they were not particularly striking.

From Chenonceaux the author went to Amboise, passing through Tours again on his way. At Amboise he found the most charming of little Gothic chapels standing in the Castle gardens, and built on a solid rock towering high above the town. It was dedicated to St. Hubert of Liège, and over the two little western doorways under one arch is carved a large representation of his miraculous meeting, while hunting one day in Holy Week in the Forest of Ardennes, with a pure white stag bearing a crucifix between its horns. He afterwards lived for some years as a hermit in the Forest of Ardennes, but was at length ordained priest and finally made Bishop of Liège, and at his death was canonised as the patron saint of the chase and dogs. This little chapel dedicated to him was worth a good deal of study.

It was a cruciform structure, measuring 40 ft. by 30 ft. inside. A plain stone slab on the floor of the chapel, with his name inscribed, marks the grave of Leonardo da Vinci.

The Château of Chenonceaux was an interesting building of red brick and stone dressings, built about the end of the fifteenth century, and containing a good deal of useful detail. Two great towers sprang from the base of the rock on which the castle stood; they were 42 ft. in diameter and 92 ft. in height, and each contained, instead of a staircase, a great inclined plane broad enough almost to allow a coach-and-four to drive up. The Romanesque Church of St. Denis was well worth a visit; it contained some good twelfth-century detail and a handsome north door.

The author's next stopping-place was Blois. He supposed that the best known feature about the Château of Blois was the great open staircase standing in the courtyard of the castle. There was also a very excellent fifteenth century staircase of red brick and stone dressings, of which there was a good illustration in Mr. Norman Shaw's sketches of Mediæval architecture. The greater part of the château has been restored by the Government, and, although it had been undoubtedly well done, it struck the author that it had been somewhat overpainted, as, inside at least, it was impossible to tell what was old and what was new work, and he often found himself wondering whether some paint-laden detail was of stone or wood. The work at the château was of various dates, from the thirteenth century Salle des États down to the western side of the quadrangle, erected by one of the Mansards, who, it was said, hoped to be able at some future time to remodel the three remaining sides of the quadrangle to suit the one he had already put up; happily that idea was never accomplished. The Salle des États was a big hall, 97 ft. long by 59 ft. broad, with a row of cylindrical columns running down the middle, supporting pointed thirteenth-century arches with a broad, flat soffit. It had been so much restored that it savoured now rather much of modern thirteenth-century Gothic. At first sight it seemed a somewhat undesirable arrangement in a salle des états to have a row of columns running right down the middle of the room, but, of course, it depended entirely upon the arrangement of the seats.

There were several good churches in Blois. The principal one was St. Nicholas, a large cruciform twelfth-century church, with the crossing covered by a Gothic dome, which was covered outside by a wooden flèche. Then there was the cathedral and the Renaissance church of St. Vincent de Paul, close to the château. There were a few good domestic details about the place, mostly in unexpected corners, but most of the streets were comparatively modern and uninteresting. From Blois the author went by train to Menars, whence he walked to Chambord. Of all the famous châteaux he saw during his tour, the most striking, the largest, and certainly the one which left the most vivid impression on his mind, was the Château de Chambord. But here, although the great house was empty, and stripped of its furniture, and although it was skilfully planned, boldly executed, and carefully finished—a lesson to architectural students of all ages and countries—by the order of the owner's agent no one, unless he were a student of the École des Beaux Arts, was allowed to make any drawing inside the house, or on the terraces at the top, or in the open galleries. Perhaps, on behalf of English architectural students, the Institute or the Association might be persuaded to take some action in regard to this matter before the summer holidays were with us again, so as to get for the English student the same privileges that were granted to, but he believed little appreciated by, the French students.

At Orleans the author visited the cathedral, a Gothic erection of the seventeenth century and singularly uninteresting. There was, however, some good domestic work in Orleans.

Leaving Orleans he travelled on to a place that was little known to English architects, though a great deal visited by Americans, viz., the town of Chateaudun. It contained a most interesting château of late Gothic or early Renaissance, which was absolutely untouched by the hand of the restorer, and over which one was allowed to roam at will unaccompanied by any chattering guide or romancing *cicerone*, and in which the sketcher could work undisturbed by visitors from morning to night. The chief feature about this château was a staircase which was illustrated in Viollet-le-Duc's "Dictionnaire." There were two or three good bits of domestic work in Chateaudun, one of the best of which was the Maison des Petits Bonhommes, a house with a stone ground-floor and a half-timbered first-floor, supported on sixteen wooden brackets, each of which was carved (so it was said) unto the likeness of some local celebrity of the sixteenth century.

The author spent the last fortnight of his tour at Rouen, chiefly in measuring up the sacristy of St. Ouen, where the old sacristan gave him a very animated and interesting description of a visit made by Mr. Ruskin to the church. Mr. Ruskin's most salient criticism, done into English, seemed to have been that the church was too light for a religious building. The Church of St. Ouen at Rouen and the Cathedral of Chartres were, probably the two most famous churches which the author visited during his tour, and he was struck by the contrast between them, although they were built by the same nation and for people of the same creed. Chartres gave one an idea of grandeur and simplicity of detail, of massiveness and everlasting strength. In the great nave, which was low for a French church, even on the brightest days the light which came through the stained glass windows was subdued, and the church was in a perpetual twilight. St. Ouen, on the other hand, was lightness written in stone. Inside, the church was as light as a conservatory, and every line seemed soaring upwards. Besides St. Ouen, there was the Cathedral of Rouen, which was worth some weeks of study. The third great church of Rouen was St. Maclou; and the Church of St. Patrice had a very good, simple plan. The aisles ran the whole length of the church, but by the choir there were double aisles on each side, which arrangement gave a very good effect. There were many other churches and buildings in Rouen which were worth attention, and these were described by the author in concluding his paper.

The Chairman, in inviting discussion, said that Mr. Bartlett had given them a very interesting paper, although he was afraid that there was not a very great deal to discuss in it, from the nature of the subject.

Mr. F. R. Farrow proposed a vote of thanks to Mr. Bartlett for his interesting paper, and for exhibiting his drawings, the large number of which showed that he had made good use of his time during his seven weeks' tour. He thought that Mr. Bartlett had maintained the honour of the A. A. Travelling Studentship in a very worthy fashion. He thought he was to be congratulated, too, upon the manner in which he had dealt with the architecture of the district he had traversed, upon the catholicity of taste which he had shown, and upon the variety of methods of study which he had adopted. He was also to be congratulated upon having brought back a great many details which would be useful to him. With regard to the use of the steep-pitched roofs of the François Premier period of architecture in France, he thought the practice was due to something more than a mere desire to build such roofs as would throw off the snow, because those roofs were abnormally steep. One of the great aims of the *noblesse* of the François Premier period was to make a great show and appearance of luxury. He believed that one reason why these steep-pitched roofs were built was that they were expensive to build. He was very much interested in the description which Mr. Bartlett gave of the little church near Löches. It was very interesting to hear of a church planned on what the Germans called the "hall" principle, which was very seldom seen outside Germany: he meant churches in which the aisles were of the same height as the nave. He thought that Mr. Bartlett had very mildly criticised the spire at Rouen, which was a most ghastly thing, spoiling the effect not only of the cathedral, but of the entire city. When visiting Rouen, members would do well to go a couple of miles out, to a little village named Boos, where they would find a very fine *colombier*, one of the finest examples of the kind to be found in that characteristic period, the French Renaissance. That period, and the Late Flamboyant period, were remarkable for these *colombiers*.

Mr. Bernard Dicksee, in seconding the vote of thanks to Mr. Bartlett, said he could not agree with Mr. Farrow that the high roofs of the François Premier period were due to any wish on the part of the owners to spend money for the mere sake of spending money. These steep-pitched roofs, he took it, were naturally descended from the high roofs of the Gothic period.

The Chairman, in putting the vote of thanks, said they had all listened with very great pleasure to the paper, and he thought that Mr. Bartlett had been very wise in choosing the district which he had traversed during his tour, for the particular style which there abounded was coming into vogue. He thought Mr. Bartlett had acted very wisely, and as all students on tour should act, in taking with him a supply of lining-paper for full-sized details. Apart from their thanks to Mr. Bartlett for the paper itself, and for the drawings which he had shown, he was additionally entitled to their thanks for having come forward in an emergency to read his paper a month before the time for which it was promised. He was sorry to say that Mr. Keith D. Young, who was to have read a paper that evening on "Hospitals," had been obliged to postpone it through an accident. Mr. Bartlett had said rather regretfully that he had not always been able to tell modern work from the old, owing to the painted decoration which he found in many of the buildings. No doubt it was sometimes aggravating to be unable to decide readily what was new and what was old, but he thought it would perhaps be more useful if students generally would ask themselves whether work was good or bad, not whether it was old or new. As to the question of the high-pitched roofs of the François Premier period, he did not know that it was a very vital one for them to consider; there was perhaps something in what Mr. Farrow had said, but he (the Chairman) took it that these large roofs were, after all, less expensive as constructions than stone façades would have been if carried up to an equivalent height. There was only one other point upon which he should like to ask for information, and that was as to the question of the cost of such a tour as Mr. Bartlett had described to them in his interesting and well-written paper.

The vote of thanks having been carried by acclamation,

Mr. Bartlett, in reply, said that in regard to cost, the tour had only cost him a pound or two more than he received as Travelling Student. He reckoned six or seven francs a day to cover all his outlay, exclusive of travelling expenses,—and these did not come to so very much. He hoped that the Association would try and get for its members the same privileges for visiting the Château de Chambord as were possessed by the students of the École des Beaux-Arts. With regard to the question of the steep-pitched roofs, he was not prepared to say anything as to their origin.

The meeting then terminated.

THE LONDON COUNTY COUNCIL.

The London County Council held its last meeting before the Easter recess, and probably its last meeting in the Council Chamber at Guildhall, on Tuesday evening last, Lord Rosebery in the chair.

Thanks to the Corporation of London.—The Chairman said that after the recess they would probably meet in their own enlarged Council Chamber at Spring Gardens. He suggested that the Council should agree to a hearty vote of thanks to the Corporation of London for their generous hospitality in lending the Guildhall Council Chamber. This was agreed to by acclamation.

Finance.—The Finance Committee brought up the estimates for the year 1890-91. Lord Lingen, in a long and explanatory speech, moved their adoption, and said that for most of the purposes of the Council they raised a rate both upon the new Administrative County of London and upon the City, but for certain purposes the City was exempt, and they had to levy a further rate upon that part of the County outside the City. That which they levied in common constituted really the rate which was imposed on the City. The proposed increased rate for the County and City together was estimated at 12·5d. in the pound, in place of 10·63d. raised in 1889-90; the rate upon the County, exclusive of the City, 7·5d., as compared with 1·90d. in 1889-90; and the total rate for the County outside the City would be 13·25d., instead of 12·53d., the rate of last year.

Mr. Campbell, in moving an amendment having reference to the form of the estimates, which was substantially adopted, pointed out that the increase of rates was only apparent,

not real. Out of 13½d. in the pound referred to as the amount of the County-rate for London outside the City, 2½d. was for Poor-law purposes, levied by the County Council instead of by the Poor-law Guardians; so that the rate for municipal purposes apart from Poor-law purposes would be about the same as that levied by the Metropolitan Board of Works—10½d. in the pound. The Poor-rates would be, or should be, reduced in a corresponding ratio to the increase of the County Council rate. The apparent increase of 2½d. in the pound would, in fact, be only transferred from one pocket to another by the ratepayer.

After a good deal of discussion, the estimates were adopted.

The Money Bill of 1890.—The Finance Committee also recommended

"That the estimate, now before the Council, of the borrowing power to be provided in the Money Bill of 1890, be approved, and that the Council do hereby estimate the amount of new borrowing power (as detailed in the estimate), as follows:—

The new borrowing power recommended is	£2,189,306
Deducting the amount required to lend to other bodies	913,216
The amount required for the Council's own purposes is	£1,276,090"

Water Companies and their Charges.—The Special Committee on Water Supply and Markets reported as follows:—"We have to report that in pursuance of the following resolution of the Council of February 11, 1890—'That in view of the quinquennial re-assessment of property in London, which will come into force next year (1891), and the resulting effect, which will give the water companies power to exact an increased charge for their supply, this Council instructs its Special Water Committee to immediately take the question into consideration, and report thereon,' we have given careful consideration to the subject of the reference, and we submit the following recommendation—

'That the Council do introduce into Parliament during the present session a Bill for the purpose of suspending the powers of the water companies to increase their charges for water consequent upon any increase that may be made in the assessment of property in the County of London by the quinquennial valuations, and that it be referred to the Parliamentary Committee to take the necessary steps for the purpose.'

Mr. James Beal, moved the adoption of this report, and it was unanimously agreed to.

Subways and Overhead Wires.—The Parliamentary Committee reported as follows:—"In concert with the Highways Committee, we have considered the thirty-seven petitions presented against the London Subways and Overhead Wires Bill by the gas, water, electric light, telephone, and other companies, and we instructed Mr. Wolfe Barry, C.E., and Mr. Cripps, the Parliamentary agent, to enter into negotiations with the various opponents in order to ascertain how far the objections expressed in these petitions might be met by modifications of the Bill. But, at a meeting with the solicitor, agent, and engineers acting for the associated water companies, these gentleman declined even to enter into discussion on any of the details of the Bill, on the ground that the Bill is wholly objectionable, and that to discuss its details might have the appearance of accepting its principle. We understood that the object of the Council in promoting this Bill was to effect some scheme by which subways could be made under streets, not solely to relieve the inhabitants and ratepayers from the inconvenience and cost due to frequent obstruction and breaking-up of the streets, but also to promote the convenience of the gas, water, and other companies, in the conduct of their business. But, having regard to the attitude of uncompromising opposition to the project taken up by so many of the companies, and to the prolonged and expensive contest which the prosecution of the Bill in its present form would apparently involve, we recommend—

'That the application to Parliament for the powers sought by the Bill as to new subways be not proceeded with this session.'

The introduction of the Bill has led to much valuable information being elicited upon the whole subject, which may enable the Council to deal with it more satisfactorily in a future session, after more mature consideration. As regards that part of the Bill which relates to overhead wires, we have been met in a more friendly spirit by the Telephone Company. Modifications have been suggested which we are not prepared to accept in their entirety, but which seem to afford a basis for further discussion, and we hope the objections to this part of the Bill may be adjusted satisfactorily, or at least narrowed to a comparatively small issue. We recommend,—

'That this part of the Bill be proceeded with, and that we be empowered to make such modifications as we may think advisable to remove or lessen opposition.'

If these recommendations are adopted by the Council, and the Bill in its amended form is passed by the House of Commons, we will report the Bill as amended to the Council for further consideration. We have consulted the Highways Committee on the points referred to in this report, and they concur with us in the above recommendations."

The recommendations were agreed to.

Building Act Business during the Easter Recess.—The Building Act Committee reported as follows:—"Your Committee believe that considerable inconvenience to the public would result from their adjournment over the Easter vacation, and they recommend—

'That the Council do, under the provisions of the Local Government Act, 1888, sec. 28 (2), delegate to the Building Act Committee power to hold one meeting during the recess, for the purpose of considering applications made to the Council under the Metropolitan Building and Management Acts, and at such meeting to act on behalf of the Council, and to grant or refuse such applications; provided, however, that the Committee shall only act upon such decisions as shall be unanimously arrived at by the members present, and that all such decisions shall be reported to the Council at its first meeting after the recess.'"

After transacting other business, the Council adjourned until Tuesday, April 22.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION:

ANNUAL DINNER.

THE twelfth annual dinner in aid of the funds of this excellent Institution was held on Monday evening last, in the Venetian Room of the Holborn Restaurant.

Mr. H. H. Bartlett (Perry & Co.) presided, and was supported by about 240 members and friends of the Institution, including Mr. Thos. F. Rider, Mr. W. A. Colls, Mr. Colin Patrick, Mr. W. Eckstein, Mr. W. R. Freeman (Mowlem & Co.), Mr. H. H. Leonard (Leonard & Clarke), Mr. Joseph Wilkinson, Mr. C. K. Turpin, Mr. E. C. Roe, Mr. Edwin Brooks, and many other gentlemen.

The usual loyal and patriotic toasts having been duly honoured, Captain Roe replying on behalf of "The Army, Navy, and Auxiliary Forces,"

The Chairman proposed the toast of the evening, "The Builders' Clerks' Benevolent Institution," and said that it had been established about a quarter of a century, and during its existence it had paid away in temporary relief and in pensions the sum of 4,173*l.*, in addition to 787*l.* spent in purchasing three orphan presentations (each one tenable for twenty-one years), making a total of 4,960*l.* During the twenty-three years of the Institution's existence thirty-two pensioners had been elected on the Relief Fund. The number on the books at the present time was nineteen. The male pensioners received 25*l.* per annum, and the widows 20*l.* That meant a very considerable annual expenditure, and it was very desirable that the regular income should be materially increased by a large addition to the number of annual subscribers, as during the past year the income resulting from the invested funds and annual subscriptions had not sufficed to meet the expenditure, and the Committee had to trench to the extent of 120*l.* upon the amount received in donations at the last annual dinner, instead of investing the whole of it, as they would have liked to do. The Institution was one eminently deserving of the support of all builders' clerks and of the building trade generally. The calling of a builder's clerk was one of some precariousness, and involved considerable strain upon the mind and nervous system. The Institution had the hearty good will and support of leading master builders, many of whom, however, were unable to be present that evening. Letters had been received expressing the inability of the writers to attend from, amongst others, Mr. Taprell Holland, Mr. Thos. Stirling, Mr. Geo. Burt, Mr. Stanley G. Bird, Mr. Howard Colls, Mr. G. H. Trollope, Professor Banister Fletcher, and Messrs. Fowler & Hugman. Speaking for the master builders generally, he was warranted in saying that they were very admirably served by their clerks, who were a body second to no body of clerks in their attainments and in their loyalty to their employers. They were engaged in a very good work in carrying on with so much energy and with so little expenditure in management an Institution so useful to the more unfortunate of their craft, and he therefore had much pleasure in proposing the toast of "The Builders' Clerks' Benevolent Institution."

The toast was very heartily received.

Mr. Joseph Wilkinson proposed "The Architects and Surveyors," coupled with the name of Mr. H. H. Leonard, who briefly replied, speaking highly of builders' clerks as a body.

Mr. W. Eckstein, in proposing "The Builders," said he regarded that toast as only second to the toast of the evening, "The Institution," for without the builders where would their clerks be? With the toast he coupled the name of Mr. W. A. Colls (Colls & Sons).

Mr. W. A. Colls, in replying, said he was quite in agreement with what had been said by previous speakers as to the excellent manner in which builders were served by their clerks.

Mr. E. Brooks (Treasurer of the Institution) proposed the past-Presidents, who were, he said, all gentlemen occupying the most prominent and respected positions in the building trade. Their first President was Alderman Sir William Lawrence, who held office in 1867. Since that date they had had a succession of able and energetic Presidents, including Mr. Thos. F. Rider, who occupied the chair for two years, and Mr. W. R. Freeman, who was also a most assiduous President. Last year they were fortunate in having as President Mr. John Aird, M.P., who was unable to be present that evening. With the toast were coupled the names of Mr. W. R. Freeman and Mr. T. F. Rider, who both briefly replied, Mr. Freeman speaking very highly of the energy and zeal of the Committee and their Secretary, Mr. H. J. Wheatley.

The remaining toasts were "The President" (proposed by Mr. T. F. Rider), and "The Visitors."

During the evening subscriptions and donations to the amount of nearly 300*l.* were announced, including 21*l.* from the Chairman

The Student's Column.

ELECTRICITY, MAGNETISM, AND ELECTRICITY SUPPLY.—XIV.

ARMATURE REACTION.

IF the armatures shown in figs. 30 and 32 be removed from the influence of the field magnets, and a current from some external source sent through the coils from P to S, the cores will become magnetised, fig. 34, so that lines of force traverse the iron

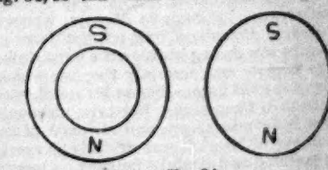


Fig. 34.

from the lowest to the highest point. The drum armature becomes a cylindrical electro-magnet, magnetised in the direction of a vertical diameter, while the ring armature is practically converted into two semi-circular magnets with their north ends in contact at the top and their south ends at the bottom. The lines of force within the cores are, of course, curved, but the coils may be regarded as producing in both cases magneto-motive force in the direction S N. Whether the currents in the coils arise from an electro-motive force altogether outside the armature, or from the electro-motive force set up within the coils themselves, when they cut lines of force as they revolve between the poles of their field magnets, can make no difference to their magnetising effects on the core. Hence, when current flows from an armature through the brushes, the coils tend to magnetise the core in *the direction of the diameter of commutation.*

To better understand this so-called "reaction of armature upon field," we may regard the core as a magnetised mass traversed by lines of force which are cut by the coils when they, the lines, pass into the core from the air, and again as they emerge into the air from the core. The core revolves, but the lines do

not, so that they may be pictured as fixed in space.

A line of force being always a closed curve, some difficulty arises in consistently stating its direction. If A and B are two points on a closed curve, the direction A B is generally understood to mean the direction along the curve which leads from A to B by the shortest path; if this is not necessarily meant, then A B may mean either direction, as it is possible to get from A to B by two paths. In the case of a magnetic line of force, if N and S are the north and south poles of a magnetised piece of iron through which it passes, the direction of the line outside the metal is from N to S, within the metal from S to N, and either portion may be meant. As confusion may arise from this cause, an arrow head is put on the three lines in fig. 35; the lettering is open to criticism, but it is consistent inasmuch as N S means the same direction in all three.

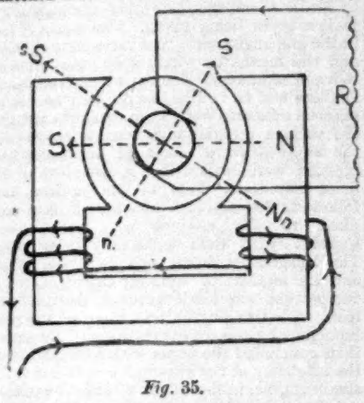


Fig. 35.

Fig. 35 represents a dynamo machine, in which the field magnets are excited by a constant current from an external source. Such a machine is said to be "separately excited," and the field magnets bring a magnetising force to bear on the armature in the direction N S. Let *n s* be the diameter of commutation, then if current is allowed to flow through the armature, the currents in the coils tend to magnetise the core in the direction *n s*, and as a consequence the core will actually be magnetised in some intermediate direction, *n*N S*s*. It has been stated in a former article that the diameter of commutation should be at right angles to the direction of the magnetisation of the armature; the brushes must, therefore, be shifted until *n s* is at right angles to *n*N S*s*.

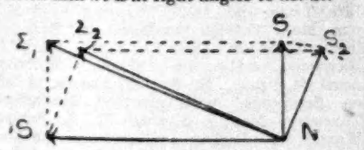


Fig 36.

The precise action is best seen by applying the parallelogram of force to lines of force. In fig. 36, N S represents in length and direction the field produced by the field magnets. With the vertical diameter of commutation let NS_2 represent, also in strength and direction, the field produced by the armature current, and $N\Sigma_2$ the resultant field. By means of a variable resistance, R, fig. 35, the armature current may be kept constant, so that the length of the line NS_2 will not vary as it turns in fig. 36. Now suppose the brushes slowly shifted forward, NS_2 may be made also to turn gradually until a position NS_2 is reached, such that NS_2 is perpendicular to the direction of the resultant field $N\Sigma_2$. And it is in this *best* position they are shown in fig. 35. The angle S_2, NS_2 is the angle of lead given to the brushes, and will obviously vary with the current taken from the machine.

A casual glance at fig. 36 might lead one to suppose that, since $N\Sigma_2$ is greater than $N\Sigma_2$, that is since the actual flux through the armature is greater in the first position than in the second, the former position would give better results. That such is not the case may be seen by again returning to the armature itself.

Let the ring H I L, fig. 37, represent the armature, O S the field produced by the field magnets, O*s* that by the armature coils with the diameter of commutation vertical, and O Σ the resultant field. Draw H L at right angles to O Σ; it has been shown, in articles XII. and XIII, that H and L are the points in the armature at which the EMF's induced in the two sets of coils are reversed, and between which there is, therefore, maximum E.M.F. But current is drawn between the points I and M; hence

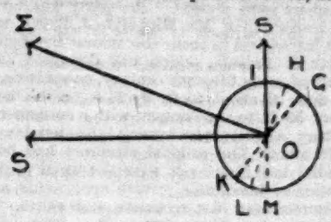


Fig. 37.

drawing G O K so that the angles G O H and I O H are equal, the coils which lie between I H and G H have the EMF's set up in them opposed to each other, hence the coils lying between the portions I G and K M of the armature neutralise each other's effects in pairs, and these parts of the winding are therefore useless.

In practice the best position for the brushes is found by shifting them until there is least sparking.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

2,601, Displaying Paper-hangings. Cotterell Bros.

This invention relates to a simple arrangement for folding in book or leaf form the patterns of different papers. When the book is unfolded all the patterns may be seen at one glance.

5,342, Raising Long Ladders. A. Haghe.

According to this invention, a light trestle of wood or iron is braced with wire ropes to the ladder just above its centre of gravity. A small winch is secured at the foot of the ladder, with a rope led to the feet of the trestle. The ladder is slightly raised, and then by working the winch, the foot is drawn towards the trestle, causing the ladder to assume a vertical position. Some modifications of the trestle arrangement are used where obstacles exist, a sill being then fixed to the foot of the ladder, and iron wires or stays led up to above the centre of gravity.

5,412, Mortar, Plaster, &c. T. K. Ferguson.

This invention relates to what is claimed as a novel combination of ingredients for use as mortar for the setting of bricks, as plaster for walls, and such like purposes. Quicklime, potassium, quartz, flint, and plaster of Paris, are used in suitable proportions, and mixed like ordinary mortar or cement.

6,624, Fire-grates. J. Farrar.

According to this invention, the fire-grate is made with vertical bars, divided so as to make the lower part a movable receptacle for fuel, and a device called a "multiple poker," which is like a detached false grate, is used for lifting part of the fire while the fuel is introduced underneath it.

6,760, Fire-grates and Stoves. J. W. Sizer.

The idea of this invention is to prevent the passage of cold air down the chimney, which would force the smoke of the fire out into the room, and to cause all the smoke produced to pass directly up the chimney. In the back wall of the chimney is built a little chamber or box with holes at each end, and a door at the underside. When the fire is made this door is open, but if the chimney is inclined to smoke the apertures in it are only partially opened, causing a much stronger draught, carrying the smoke up the chimney without fail.

NEW APPLICATIONS FOR PATENTS.

March 17.—4,129, G. Sykes, Window Fastener.—4,147, E. Waller, Wood-working Machinery.—4,150, T. Davie and A. Boutcher, Chimney Cowl.—4,155, C. Crosby, Fire grates.

March 18.—4,218, A. May, Removing Paint.

March 19.—4,267, V. Crosse, Ventilating Glass. 4,273, J. & A. Duckett, Water Closets.—4,289, J. Cullen, Safety Gas Bracket or pendant.—4,316, J. Day, Sash-fasteners. — 4,323, O. Hanneborg, Machines for Making or Laying Drains.

March 20.—4,348, T. Flower, Adjustable Spirit Level.—4,368, J. Pullan and others, Combined Brick-making and Pressing Machinery.—4,373, A. Molloy, Chimney Pots.—4,377, J. Marsh, Attaching Door-Knobs or Handles to Spindles.

March 21.—4,408, F. Adet's Ceiling and Wall Coverings.—4,458, G. Le Maistre, Sliding Sash Windows.—4,462, J. Bartlett, Ventilators.

March 22.—4,497. J. Bradley, High-pressure Hot-water Apparatus for Warming Buildings.—4,504, E. Lee, Kilns for Bricks, tiles, &c.—4,528, C. Schoone, Stone-cutting Machine.

PROVISIONAL SPECIFICATIONS ACCEPTED.

17,700, J. Thomas and others, Ventilating, &c.—1,633, J. & H. Knecht, Sharpening Saws.—2,300, S. Denison and others, Tile and Brick-making Machines.—2,321, S. Denison and others, Brick-pressing Machines.—2,371, C. Edwards, Bricks, &c.—2,542, F. Baird, Manhole-covers for Sewer-ventilating Shafts.—2,682, J. Sloan & E. Bell, Preservative Paints.—2,941, J. Appiani, Kiln.—3,343, S. Fletcher and others, Brick and Pottery Kilns.—3,533, W. Bassingham, Ventilators.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

4,881, J. Parker, Moulds for Pressing Bricks, &c.—7,537, W. Congreve & R. Brownswood, Dry-earth Closets.—8,019, W. McDonald, Ventilation, adaptable to existing Sash-windows.—8,129, S. Ingram and others, Parquetry.—8,182, J. Barford, Fireplaces.—8,444, W. McDonald, Sash-fasteners.—8,532, O. Elphick, Lavatories.—11,403, N. Proctor and others, Bricks, &c.—19,657, W. Davies, Flushing Apparatus.—2,508, B. Westerdell, Plasterers' Lathering.—2,609, C. Rogers, Screw-nails.

RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

MARCH 24.—By HILL & WEAVER.

Anerley—43 and 45, Jasmine-grove, f., r.r. £72 10s. p.a.	£580

MARCH 25.—By A. BARTON.

Lower Clapton, Gulton-rd.—"Tonby Lodge," u.t. 72 yrs., g.r. £13. 15s., r. £59	530
Brixton—9, 10, and 12, Melbourne-sq., u.t. 11 yrs., g.r. £9, r. £94 p.a., and a l.g.r. of £5, u.t. 11 yrs.	310

By FURZE & ALDRIDGE.

Brixton—40, Mervan-rd., u.t. 85 yrs., g.r. £7. 7s.	435

By B. BROWN.

Bow—28 to 34 (even), Nairn-st., u.t. 83 yrs., g.r. £17, r. £124. 16s.	750

By DEBENHAM, TEWSON, & CO.

Strand—43, Catherine-st., f., area 1,642 ft.	2,500
Highbury—"Highbury Lodge" and 4a. 3r. 37p., f.	12,000

By RUSHWORTH & STEVENS.

Oxford-st.—3 to 6, Dolphin-ct., f.	1,250
Kentish Town—27, 29 and 35, Prince of Wales-rd., f.	1,170
Lower Norwood—5 and 6, Gipsy-rd., f., r. £105 p.a.	1,110
Barnes—1 and 2, Eleanor Cottages, f., r. £55 p.a.	515
Herne Bay—43, High-st., f., r. £40 p.a.	320

By CHADWICK & SONS.

Harrow-rd.—80, Clarendon-st., u.t. 62 yrs., g.r. £5. 10s.	250
Battersea—103, Lavender-rd., u.t. 56 yrs., g.r. £5.	140

By E. WOOD.

Brixton—17, 19, and 21, Railton-rd., u.t. 78 yrs., g.r. £18. 18s., r. £117	730
Herne Hill—16 and 18, Hurst-st., u.t. 57 yrs., g.r. £11, r. £65	350
Walworth—95, Lorraine-rd., u.t. 61 yrs., g.r. £4. 5s.	370
Bermondsey—102, Drummond-rd., u.t. 54 yrs., g.r. £4	375
Wood Green, Finsbury-rd.—"Providence House," f., r. £30	310
Bromley-by-Bow—29, 31, 37, and 39, Blackthorn-st., u.t. 74 yrs., g.r. £11. 10s.	380

MARCH 26.—By Messrs. WOODS.

Rotherhithe, New-rd.—No. 198, u.t. 63 yrs., g.r. £4, r. £36	330

By C. C. TAYLOR & SON.

Mile-end—30 and 32, Lognor-rd., u.t. 74 yrs., g.r. £7, r. £46. 16s.	275
25, 27, and 29, Clark-st., u.t. 4 yrs., g.r. £9, r. £84 p.a.	95
St. George's-in-the-East—50, Richard-st., u.t. 10 yrs., g.r. £2. 9s. 2d.	95

By FULLER, HORSEY, SONS, & CASSELL.

Hoxton—50, Pitfield-st., lease and goodwill, u.t. 5 yrs., r. £90	55
Camberwell—179, St. George's-rd., u.t. 14 yrs., r. £50, lease and goodwill	55
Walworth—27, East-st., lease and goodwill, u.t. 1 yr., r. £42	9
Stepney—43, Ben Jonson-rd., lease and goodwill, u.t. 15 yrs., r. £60	195
Smithfield—31, Newbury-st., lease and goodwill, u.t. 12 yrs., r. £81. 11s.	21

By P. MATTHEWS.

Bow—122 to 132 (even) Burdett-rd., and 1, St. Ann's-rd., f., r. £187. 4s.	1,900
153 to 163 (odd), Bow-common-lane, u.t. 64 yrs., g.r. £20, r. £175. 10s.	1,210

By DOUGLAS YOUNG.

Brixton—Loughborough-rd., "The Hero of Switzerland" public-house, u.t. 13 yrs., g.r. £16. 16s. p.a.	240
House, nursery, and premises adjoining, u.t. 13 yrs., g.r. £3	130
144, Loughborough-rd., u.t. 32 yrs., g.r. £2. 17s., r. £31. 10s.	275

MARCH 27.—By DYER, SON, & HILTON.

Blackheath—44, Tranquil Vale and Goodwill, u.t. 94 yrs., r. £19	350
L.g.r. of £25, u.t. 35 yrs., with reversion to rr. for 24 yrs.	540

By G. HEAD & CO.

Marylebone—L.g.r. of £40, u.t. 25 yrs.	430

By C. & H. WHITE.

Brixton—195, Brixton-hill, f.	1,260
Clapham-rd.—76, Claylands-rd., u.t. 84 yrs., g.r. £4, r. £32	220

By FARNBROTHER, ELLIS, & CO.

Fenchurch-st.—F.g.r. of £570 p.a., with reversion in 60 yrs.	17,300
Tooting—Three plots of freehold land	1,080

By NEWSON & HARDING.

Shoreditch—6 to 31, Austin-st., f., r. £374. 8s. p.a.	2,950
South Hackney—99, 101, 103, and 105, Cassland-rd., u.t. 48 yrs., g.r. £16	1,150

By E. Stimson.

East Dulwich—L.g.r. of £43 p.a., u.t. 85 yrs. £860
L.g.r. of £93. 10s. p.a., u.t. 85 yrs. 1,900
L.g.r. of £61. 10s. p.a., u.t. 85 yrs. 1,250
Camberwell—L.g.r. of £175, u.t. 66 yrs., g.r. £30.. 1,680
27, Kimpton Pk., u.t. 66 yrs., g.r. £1. 5s., r. £33. 8s. 185
Peckham—F.g.r. of £30 p.a., with reversion in 85 yrs. 720
F.g.r. of £25 p.a., with reversion in 85 yrs. 600

By E. Wood.

Holloway—14, Hugo Pk., u.t. 79 yrs., g.r. £6. 10s., r. £35 350
88, Duncombe-rd., u.t. 87¼ yrs., g.r. £5, r. £32. 10s. 220
18, 19, and 20, Corporation-st., u.t. 71 yrs., g.r. £22. 10s. 640
Kentish Town—38, Leighton-grove, u.t. 50 yrs., g.r. £6. 6s., r. £40 400
Wandsworth—3, 5, and 7, Berber-rd., u.t. 91 yrs., g.r. £19. 10s., r. £86 700
Poplar—20, Ann-st., f., r. £16. 18s. p.a. 125

By Beard & Son.

St. John's Wood—20 and 30, Boundary-rd., u.t. 47 yrs., g.r. £21, r. £165 1,915
85, 87, and 89, Abbey-rd., u.t. 60 yrs., g.r. £30, r. £225 p.a. 2,085
22, Chalk Farm-rd., u.t. 40 yrs., g.r. £7. 10s., r. £80 915
L.g.r. of £30 p.a., u.t. 47 yrs. 610
Lambeth—214, South Lambeth-rd., f., r. £40 660
Bayswater—111 to 121 (odd), Cornwall-rd., u.t. 74 yrs., g.r. £ 4,085
1 to 7, Clydesdale-mews, u.t. 74 yrs., g.r. £25. 9s., r. £192. 8s. 1,900
Harrow-on-the-Hill—"Preston House" and two villa residences, and 2 acres, f., r. £104 p.a. 2,500

March 28.—By Eastman Bros.

Bermondsey—6, 7 and 8, Lamb-alley, f. 570

By F. Wells & Read.

Holloway—3, Ashbrook-road, u.t. 84 yrs, g.r. £4. 15s. r. £30 310

By Jones, Lang & Co.

Edmonton—A plot of f. land, 0a. 2r. 11p. 60

By Baker & Sons.

Clare Market..f.g.r. of £27, with reversion in 33 yrs. 650
City of London—17, Hutchinson-st., f.r. £44 p.a. 460
Southwark—24 and 25, Pitt's-pl., f.r. £38. 6d. p.a. 320

By Ellis & Son.

Islington—l.g.r. of £86 p.a., u.t. 28 yrs., at a g.r. of £21. 405
12, Northampton-st., u.t. 28 yrs., g.r. £6, r. £26 185

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; yd. for yard, &c.]

MEETINGS.

Saturday, April 5.

Association of Public Sanitary Inspectors.—Mr. F. T. Poulson on "Social Environments." 6 p.m.

Monday, April 7.

Royal Institution.—General monthly meeting. 5 p.m.
Liverpool Architectural Society.—Mr. W. E. Hill on "Ormskirk Parish Church."

Thursday, April 10.

Guild and School of Handicraft.—Mr. T. Cobden Sanderson on "Book-bindin (34, Commercial-street, E.). 8 p.m.
Institution of Electrical Engineers.—8 p.m.
Edinburgh Architectural Association.—Mr. John Keppie on "Accessories of Architecture." 8 p.m.

Miscellanea.

Proposed Bas-relief in Rome in Honour of Sir Joseph Lister.—In Rome the magnificent Policlinico Umberto I., or great medical and surgical hospital and school, now slowly rising to completion, is to have its two principal façades ornamented with bas-reliefs in honour of the two men who, in the judgment of our Italian brethren, have conferred the most signal benefits on the sister branches of the healing art. Medicine is to be represented by the pioneer of pathology as it is now studied and taught, Giovanni Battista Morgagni, of Padua; surgery, by the author of the antiseptic system, Sir Joseph Lister. Already a competition for the best designs for the bas-reliefs in question has been announced, and a Commissione Aggiudicatrice, consisting of two architects, two sculptors, and two painters, has been formed, under the presidency of the guiding spirit of the Policlinico, Professor Guido Baccelli. The best artists in Italy are expected to compete, the prize for the successful design of each bas-relief being great enough to induce the leaders of the statuary art throughout the peninsula to suspend all other engagements for the honourable rivalry. The stone employed for the bas-reliefs will be the "pietra di Monte Afliano," well chosen to combine the requisites of fineness of grain, richness of colour, and durability for the material in which Rome seeks to embody a worthy accession to her artistic masterpieces.—*Lancet.*

Edinburgh Architectural Association.—On Saturday afternoon last the Edinburgh Architectural Association visited Prestonpans, and, notwithstanding the somewhat unsettled condition of the weather, a large number of members were present. The party was under the leadership of Mr. Hippolyte J. Blanc, who first introduced to them the interesting feudal tower of Preston, which was described as a work of early fifteenth century, comprising, in an area of about 34 ft. by 28 ft., a tall keep about 50 ft. to the parapet, with a seventeenth century addition, increasing the height by 17 ft. more. The original structure had been divided into four floors, with the usual appropriation of lord's hall, private apartments, and accommodation for retainers and stores. In a wing projected from the west side of the keep an interesting and unique construction of dungeons was examined, as also the special features of construction for the defence of the main entrance exhibited on the outside elevations. Originally a possession of the Hamiltons, the tower has remained, with but short intervals, from the period of its erection with the family; and although much of the property originally attached to it has been disposed of, the tower itself, with the enclosure in which it stands, is now owned by General Sir William Hamilton, through whose kindness the party was allowed to view it. The tower seems to have been occupied up to 1663, when a fire, the third from which it had suffered, rendered it no longer habitable. It possesses a good deal of interesting detail, sufficient to have elicited the interest of antiquaries, by whom, a few years ago, a considerable sum was expended, under the direction of Mr. Blanc, in replacing a great deal of the carved stonework found among the ruins, and generally repairing the structure. The party next proceeded to Preston Cross, which was explained to be one of a type of market crosses erected in various towns in Scotland at the beginning of the seventeenth century. Its details were separately pointed out and examined, and after visiting the ruins of Preston House,—the mansion of the Hamiltons after their occupancy of the Tower,—and the old parish church of Preston, the party returned by Northfield House, the apartments of which the party, by the permission of the agents, Messrs. Davidson & Syme, had an opportunity of examining. Points of interest were also brought under notice by the Rev. Mr. Mackay, of Prestonpans, who, in the absence through illness of Mr. Hislop, accompanied the party through their two hours' very enjoyable visit.—*Scotsman.*

Guy's Hospital.—The students' new Residential College, which has been built after the designs of Messrs. Woodd & Ainslie, architects, was opened on the 26th ult. by the Rt. Hon. W. E. Gladstone. The building is four-sided, but not rectangular, and is adapted for purposes of chambers and a medical students' club. The club premises comprise a gymnasium in the inner court, a dining-hall, with open timber roof, and a reading and smoking-room. The residential portion consists of a Warden's house, with apartments for the house staff, and thirty-nine sets of rooms, varying from one to three rooms apiece, to be let at rents ranging from 9s. to 20s. per week each. Thirty-four of these contain two rooms. This provision for medical students within the hospital precincts is a considerable improvement when contrasted with what it used to be in the times illustrated and described by Cruikshank, Albert Smith, and Dickens,—such as, for instance, Bob Sawyer's "first-floor front" in Lant-street, Borough. We shall publish an illustration of the new building next week.

Trade Dinner.—The foremen and workmen now employed by Messrs. Foster & Dicksee (of Rugby, and Manresa-road, Chelsea) on their London contracts, held their annual dinner at Cloot's Restaurant, Victorin-street, S.W., on Tuesday evening, March 25. Upwards of 100 were present, and a very pleasant evening was spent. Mr. Dicksee presided, and was supported by Mr. Goddard, the head of the London staff.

Royal Victoria Hall, Waterloo-bridge-road.—The following "Penny Science Lectures" are arranged for April:—April 15, "The Colours of a Soap-bubble," illustrated by slides and experiments, by Mr. John Cox, late Fellow of Trinity College, Cambridge. April 22, Rev. Blomfield Jackson, on "Old London," with dissolving views. April 29, Sir Vincent Barrington on "Personal Experiences of Ambulance-work During War."

Liverpool Engineering Society.—The twelfth ordinary meeting of the sixteenth session of this Society was held on Wednesday evening, March 26, Mr. Henry H. West, M. Inst. C.E., President, in the chair. After the usual business, a paper was read by Mr. Thomas L. Miller, Assoc.-M. Inst. C.E., M.I.M.E., on the "Efficiency of Gas Engines." In his opening remarks the author referred to the practice of stating the efficiency of gas engines in terms of the gas consumption per horse-power per hour, without any reference to the thermal value of the gas used, and showed, from a comparison of the calorific value of the gas in different districts, how unfair such a practice was when the efficiency of engines tested in different localities were so compared. An explanation of the different senses in which the term "efficiency" was used in the paper was then given, after which the author proceeded to explain the system of classification of gas engines adopted by Mr. D. Clerk, the theoretical efficiency of the various types being given. The causes of loss in the gas engine were then referred to in detail, and the means by which such losses might be reduced explained. The experiments of Messrs. D. Clerk and G. C. Douglas on the explosion of gaseous mixtures were then touched upon, and the various theories advanced to account for the suppression of heat at the moment of ignition were dealt with. A discussion of the more important tests of gas engines then followed, the absolute amount of heat supplied to the engines per horse-power, together with their efficiency, being given. The Hargreaves Motor was then referred to, and its method of working explained, and a comparison was made between the results of tests with this engine and those of the most economical gas-engines mentioned. The author then concluded the paper with a comparison of the efficiency of the gas-engine with that of the steam-engine, in the course of which he pointed out that, while the gas-engine had the advantage from a thermo-dynamic point of view, the high price of its fuel soon placed it at a disadvantage, as, with coal-gas at 3s. per 1,000 cubic feet and coal at 15s. per ton, the gas-engine, with a consumption of 20 cubic feet of gas per indicated horse-power per hour was just equal in cost of fuel to that of a steam-engine indicating 1 horse-power per hour for a consumption of 9 lbs. of coal. The discussion was adjourned to Wednesday, April 16th.

Guild and School of Handicraft.—The following course of lectures will be given in the Workshop of the School of Handicraft, 34, Commercial-street, E. (admission free), viz.:—Thursday, April 3, 8 p.m., Mr. Henry Holiday, on "'Looking Backward,' in its Relation to Life, Taste, and Art." Thursday, April 10, 8 p.m., Mr. T. Cobden Sanderson, on "Bookbinding." Thursday, April 17, 8 p.m., Mr. W. B. Richmond, A.R.A., on "Gesso." Thursday, April 24, 8 p.m., Mr. Stirling Lee, on "A Talk on Sculpture," with practical illustrations. Thursday, May 1, 8 p.m., Mr. E. Prioleau Warren, on "Parlour Architecture." On Monday, May 5, C. R. Ashbee (Architect and Hon. Director of the Guild of Schools) will give a lecture on "The Architectural Story of England." The chair will be taken at 8 p.m. by the Most Hon. the Marquis of Ripon, K.G. Admission to this lecture will also be free. It will be the first of a course of six on "Architecture as the Language of the English People."

Partnerships.—Mr. Wm. Kidner, F.R.I.B.A., of 23, Old Broad-street, has taken into partnership Mr. W. H. Atkin Berry, A.R.I.B.A., formerly of 35, Bedford-row, who has been associated with Mr. Kidner in business for periods extending over the last seven years. The new firm's practice as architects and surveyors will be carried on at Old Broad-street under the style of "Kidner & Berry."——We understand that Mr. Edward G. Williams, for some years manager to Messrs. Goodman & Company, brick and cement merchants, of Bishopsgate-street, has been taken into partnership by Messrs. Pilkington & Co., of King William-street, who have made arrangements to extend the scope of their trading operations to slating and tiling (encaustic and roofing).

The "Archer" Drain-pipe Joint.—We are asked to mention that a company has been formed (of which Colonel A. C. Hamilton, late Royal Engineers, is Chairman) to make and sell sanitary tubes with "Archer joints," and that offices and show-rooms have been opened in Shaftesbury-avenue.

"The Air We Breathe."—Mr. W. J. Addiscott, Assoc. San. Inst., gave a lecture on the 25th ult., in the George-street Lecture Hall, Plymouth, on "The Air We Breathe." Dr. Prance occupied the chair. The lecturer dealt first with the normal condition, weight, and temperature of the atmospheric envelope which surrounds the earth, and to what depth we could plunge into this aërial ocean without losing our lives; and passed on to treat the subject from a physiological and hygienic standpoint, explaining the actions of respiration, showing how inspired air and expired air differed one from another, pointing out the dangers of breathing in air that had been breathed over and over again through the want of adequate ventilation. References were made to a number of systems which could be adopted for ventilating our rooms and public buildings, one of the newest being the Crosse ventilator, which the lecturer described as allowing of medicated or disinfected air being thrown into the room, the disinfecting fluid being held in a neat metal trough out of sight, the advantage claimed for this mode being that no space was taken up by unsightly tubes, shafts, &c., the whole contrivance being built into the wall, and coming flush with its surface. The Banner, Boyle, and other ventilators were shown and explained, and the lecturer concluded by an experiment showing that as well as providing outlets for foul air, provision must be made for supplying fresh air, or the extractors would not and could not be expected to work.

Drainage and Paving of New Orleans.—According to a recent report of the British Consul at New Orleans, the project for draining and paving that city by means of a tax on landed property, to be passed judgment upon by public vote, has been defeated. The measure was opposed by all the objections attached to public works in American municipalities; but it had hardly been defeated before its adversaries repented of their work,—the deliberate refusal of a city of 250,000 inhabitants to protect dirt and preserve disease having subjected it not only to unfavourable comment, but to actual loss. The frost, which helped to destroy the germs of disease, and the rain-storms, which supplemented the scavengers' incomplete labours, have been withheld, and the canals, gutters, and streets are in a condition which threatens disaster when summer sets in.

Soothill Nether Sewerage.—Mr. Arnold Taylor a few days since held an inquiry at the Board-room, Soothill Nether, near Dewsbury, with respect to taking four acres of land otherwise than by agreement, for the purpose of dealing with the sewage of the district. Mr. Malcolm Paterson, M.Inst.C.E., of Bradford, explained the scheme. The estimated cost is 11,500*l.*, inclusive of the main drainage of the district, sewage-tanks for lime-treatment, and land for intermittent filtration. A special feature of the scheme is the provision for taking trade refuse into the sewers, in accordance with the Rivers Pollution Act, 1875, thus striking at the root of rivers pollution in the manufacturing districts. Soothill Nether is one of the districts proposed to be incorporated by Dewsbury, whose extension scheme, however, was rejected in its entirety by the Local Government Board.

PRICES CURRENT OF MATERIALS.

TIMBER.	£. s. d.	£. s. d.
Greenheart, B.G. ton	6 15 0	7 5 0
Teak, E.I. load	11 0 0	14 0 0
Sequoia, U.S. foot cube	0 2 3	0 3 0
Ash, Canada load	3 0 0	4 5 0
Birch "	3 0 0	5 0 0
Elm "	3 10 0	4 15 0
Fir, Dantzic, &c.	2 0 0	3 10 0
Oak "	2 10 0	4 10 0
Canada	5 10 0	6 10 0
Pine, Canada red	2 10 0	3 10 0
" yellow	2 0 0	5 5 0
Lath, Dantzic fathom	5 0 0	6 0 0
St. Petersburg	5 0 0	7 10 0
Wainscot, Riga, &c. log	0 0 0	0 0 0
Deals, Finland, 2nd and 1st. std. 100	8 0 0	11 0 0
" " 4th and 3rd	7 0 0	7 10 0
Riga	7 0 0	8 10 0
St. Petersburg, 1st yellow	10 0 0	14 0 0
" 2nd "	8 0 0	10 0 0
" white	6 10 0	10 0 0
Swedish	7 10 0	15 10 0
White Sea	8 0 0	17 0 0
Canada, Pine, 1st	15 0 0	20 0 0
" " 2nd	10 10 0	17 0 0
" " 3rd, &c.	7 0 0	10 0 0
" Spruce, 1st	8 15 0	11 0 0
" " 3rd and 2nd	6 15 0	8 10 0
New Brunswick, &c.	6 0 0	8 10 0
Battens, all kinds	6 0 0	16 0 0
Flooring Boards, sq., 1 in., prepared, First	0 11 0	0 14 0
Second	0 8 0	0 10 6
Other qualities	0 6 0	0 7 9

TIMBER (*continued*).	£. s. d.	£. s. d.
Cedar, Cuba foot	0 0 4	0 0 4½
Honduras, &c.	0 0 4	0 0 4½
Mahogany, Cuba	0 0 4½	0 0 6½
St. Domingo, cargo average	0 0 4½	0 0 6½
Mexican, cargo average	0 0 4½	0 0 5½
Tobasco "	0 0 5½	0 0 6½
Honduras "	0 0 5½	0 0 6½
Box, Turkey ton	4 0 0	12 0 0
Rose, Rio	15 0 0	20 0 0
Bahia	14 0 0	18 0 0
Satin, St. Domingo foot	0 0 6	0 1 3
Porto Rico	0 0 10	0 1 3
Walnut, Italian	0 0 4½	0 0 7
METALS.		
Iron—Bar, Welsh, in London tn	8 2 6	8 10 0
" " at works in Wales	7 15 0	8 0 0
" Staffordshire, in London	8 10 0	9 10 0
Copper—British, cake and ingot	52 0 0	53 10 0
Best selected	55 0 0	56 0 0
Sheets, strong	62 0 0	0 0 0
Chili, bars	48 10 0	0 0 0

METALS (*continued*).	£. s. d.	£. s. d.
Yellow Metal lb.	0 0 5½	0 0 6
Lead—Pig, Spanish ton	12 12 0	0 0 0
English, com. brands	12 12 0	12 12 6
Sheet, English	14 10 0	0 0 0
Pipe	15 0 0	0 0 0
Tin—Straits	90 15 0	0 0 0
Australian	90 10 0	0 0 0
English Ingots	95 0 0	0 0 0
OILS.		
Linseed ton	23 15 0	23 0 0
Cocoanut, Cochin	25 10 0	0 0 0
Cocoanut, Ceylon	25 5 0	0 0 0
Palm, Lagos	24 10 0	24 15 0
Rapeseed, English pale	32 5 0	0 0 0
" brown	30 15 0	31 0 0
Cottonseed, refined	22 5 0	0 0 0
Tallow and Oleine	21 0 0	40 0 0
Lubricating, U.S.	5 10 0	6 0 0
" refined	7 0 0	12 0 0
Tar—Stockholm barrel	1 6 0	0 0 0
Archangel	0 17 3	0 0 0

COMPETITION, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

COMPETITION.

Nature of Work.	By whom Required.	Premium.	Designs to be delivered.	Page
Public Library	Whitechapel Commrs.	Not stated	Not stated.	xii.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Additional Workshop Accommodation	Hackney Union	W. Barnett	April 9th	ii.
Stoneware Pipe Drain, &c.	Twickenham Local Bd.	H. M. Ramsay	April 10th	xii.
Alterations at Schools	Westminster Union	J. Waldram	April 11th	ii.
New Fitting Department Buildings	Sheffield Gas Light Co.	F. W. Stevenson	April 14th	ii.
Brick Sewers	St. Giles' Bd. of Wks.	G. Wallace	do.	ii.
Wooden Blocks for Paving	Paddington Vestry	*Official*	do.	xii.
Wood Paving	do.	do.	do.	xii.
Thames Ballast, Sand, and Cement	do.	do.	do.	xii.
Outfall Sewers	West Ham Council	Lewis Angell	April 15th	xii.
Additions to Railway Hotel, Yatton	Great Western Ry. Co.	*Official*	April 16th	xii.
Works at Milford	do.	do.	do.	xii.
Cast-iron Water Mains	Hastings R.S.A.	Jeffery & Skiller	do.	ii.
Telegraph Factory, Clerkenwell	Com. of H.M. Works	*Official*	April 17th	ii.
Additions to General Post-Office East, E.C.	do.	do.	do.	ii.
Filth Hoists, &c., Barking Outfall	London County Council	do.	April 21st	xii.
Depot and Store, Upper Thames-street	Com. of Sewers	do.	April 25th	xii.
Supply of Road Materials, &c.	Colchester Town Coun.	H. Goodyear	April 28th	xii.
Mission Buildings, Kensal-road, W.		A. R. Pite & Son	Not stated.	xii.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Accounts Checking Clerk	London County Council	200*l.*	April 15th	xvi.
Building and Drainage Inspector	Croydon Corporation	42*s.* weekly	April 21st	xvi.

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 noon on *Thursdays*.]

ASHTON-UNDER-LYNE.—For alterations to the "Stamford Park Hotel." Mr. J. H. Burton, architect, Warrington-street, Ashton-under-Lyne:—

J. W. Williamson, Ashton	£523 0 0
Jabez Gibson, Dukinfield	515 0 0
Underwood & Bro., Dukinfield	496 0 0
W. Tickle, Ashton	493 0 0
Jno. Robinson, Ashton	490 0 0
R. H. Booth, Stalybridge	489 0 0
Thos. Dean, Ashton	465 0 0
H. Gardner, Ashton	460 0 0
H. Rowland, Ashton (accepted)	427 0 0

BOURNE END (Bucks).—For new Club House at Bourne End, Bucks, for the Upper Thames Sailing Club. Mr. Arthur Vernon, architect, 26, Great George-street, Westminster, S.W.:—

Silver	£795 0 0
Gibson	728 12 4
Lovell	710 0 0
J. Woodbridge	665 0 0
Nash & Sons	597 10 0
Hunt (accepted)	579 0 0

BROMLEY.—For repairs at the "Red Cross," Keston; "Greyhound," Bromley; and "Plough," Bromley-common; for Messrs. H. & V. Nicholl, Limited. Mr. Albert L. Guy, architect and surveyor, 78, High-street, Lewisham:—

Pritchard	£244 0 0
T. Knight	221 0 0
Fisher	198 10 0
R. Hoare	187 15 0
D. Payne (accepted)	105 0 0

CROYDON.—For the erection of convalescent home, Brighton-road, South Croydon. Mr. Alfred Hill, architect. Quantities supplied:—

Maides & Harper	£1,329 0 0
Docking	1,205 0 0
Evans	1,165 0 0
J. O. Richardson	1,116 0 0
Smith & Bulled	1,097 0 0
Bullock	1,097 0 0
Saunders	1,085 0 0
Page	1,083 0 0
Nottle	1,080 0 0

CATFORD.—For alterations and repairs to the "Tiger's Head" public-house, Southend, Catford, for Messrs. H. & V. Nicholl, Limited. Mr. Albert L. Guy, architect and surveyor, 78, High-street, Lewisham:—

Soper	£197 0 0
Robson	168 0 0
Hoare	161 0 0
Pritchard (accepted)	160 10 0
Paperer's Work.	
Williamson (accepted)	30 0 0

COLCHESTER.—For alterations and additions to premises and for building drying oven, for Mr. J. R. Scarnitt, Wyre-street. Mr. J. W. Start, architect, Cups Chambers, Colchester:—

	Alterations.	Drying Oven.
W. Shead, jun.	£226 10 0	£36 5 0
Geo. Dobson	194 0 0	104 0 0
W. A. Chambers*	186 0 0	93 0 0

(All of Colchester.) * Accepted.

ENFIELD.—For alterations and repairs to premises at Baker-street, for Mr. Pierce. Mr. Alfred Bowyer, surveyor, Enfield Town:—

Woodfield	£205 0 0
Crabb	194 0 0
Gibson Bros.	193 10 0
Smithers	185 0 0
Sayer (accepted)	179 10 0

LONDON.—For the erection of six cottages in Whitecross-street, Southwark, S.E. Mr. E. Hoole, architect. No quantities supplied:—

Macfarlane	£1,294 0 0
J. O. Richardson	1,258 0 0
Holloway (accepted)	1,220 0 0

LONDON.—For alterations and additions to the "Clock House" public-house, Leather-lane, E.C., for Mr. Lavell. Mr. Albert L. Guy, architect and surveyor, 78, High-street, Lewisham:—

Pritchard	£279 0 0
Way	253 0 0
S. Pocock	231 0 0

LONDON.—For alterations and repairs to the "Anchor" public-house, Lewisham, for Messrs. H. & V. Nicholl, Limited. Mr. Albert L. Guy, architect and surveyor, 78, High-street, Lewisham:—

Soper	£277 0 0
Robson	270 0 0
Pritchard	265 0 0
Hoare	198 10 0

LONDON.—For the erection of new warehouses and business premises in Hammersmith, for Mr. W. J. Walsh. Mr. J. Hume, architect and surveyor, 136, High-road, Chiswick:—

H. J. Greenham (accepted)	£940 0 0

LONDON.—For the erection of store buildings, stable, bothy, &c., in Kennington Park, &c., for the London County Council:—

Barnum & Son	£770 0 0
Ball & Brown	745 0 0
Buller	643 0 0
Tarrant	610 0 0
Simmons Bros.	597 0 0
Lapthorne	549 0 0
Channing	546 0 0
King Bros.	519 0 0
Mays	425 0 0

LONDON.—For sundry painting and repairing works at Victoria Park and Bethnal Green-gardens, for the London County Council:—

Channing	£576 0 0
King Bros.	561 0 0
Humphrey	295 0 0
Barrett & Power	271 0 0
G. Barker	230 0 0

LONDON.—For alterations and repairs, &c., at No. 71, Newington Green-road, N., for Mrs. Higginbotham. Mr. Horace Gilbert, architect, 59, Chelsham-road, S.W.:—

	Estimate No. 1.	Estimate No. 2.	Repairs and Painting.
A. & W. Garnar	£264	£249	£46 10
J. H. Thompson (too late)	239	227	39 10
Thos. Wontner Smith & Son*	227	207	52 0
C. P. Roberts	223	197	—

* Accepted.

LONDON.—For building a block of façades adjoining Fern Cottage, Archway-road, Highgate, and sundry alterations. Mr. F. J. Chambers, 11a, College-hill, E.C., and Mr. Geo. Waymouth, 23, Moorgate-street, E.C. architects:—

G. Seed	£525 0 0
W. H. Lorden & Son	497 0 0
H. Cattle	420 0 0
G. Parker	410 0 0
Thos. Wontner Smith & Son	395 0 0

LONDON.—For proposed alteration and additions to shop and premises, Hornsey-road, for Mr. W. J. Crawford. Mr. J. Hume, architect and surveyor, Chiswick:—

Holding	£247 0 0
Horborn	210 0 0
Drake	204 10 0
H. F. Hume, Westbourne Park	196 10 0

LONDON.—For general repairs to houses in Drummond-crescent, N.W. Mr. Alfred Bowyer, surveyor, Enfield Town:—

Porter	£149 0 0
Crabb (accepted)	126 10 0

LONDON.—For additional work at the "Bell Tavern," Shoreditch, E., for Messrs. Levy & Garner. Mr. Joseph G. Needham, architect:—

A. Hood (accepted)	£225 0 0

LONDON.—For alterations, new front, &c., at No. 45, Strand, W.C., for Mr. F. F. Anstiss. Mr. H. L. Newton, architect, Victoria-street:—

Godden	£750 0 0
Osborn	717 0 0
Kellaway	677 0 0
Vears & Co.	669 0 0

LONDON.—For sundry alterations and repairs at No. 32, Canonbury Park North, N., for Mr. Thos. Bear:—

Thos. Wontner Smith & Son*	£146 14 0

* Accepted.

MITCHAM.—For the erection of married couples' quarters at the workhouse, Mitcham, for the Guardians of the Poor of the Holborn Union. Messrs. H. Saxon Snell & Son, architects. Quantities supplied:—

J. O. Richardson, Albert Works, Peckham, S.E. (accepted)	£1,870 0 0

RICHMOND.—For partly taking down and rebuilding the "Foresters Arms" public-house, Richmond, Surrey. Mr. T. Walter Moss, architect, 21, Doughty-street, London, W.C.:—

	House.	Fittings.	Total.
T. J. Mecsom	£2,425	£295	£2,720
Lansdown & Co.	2 397	266	2,663
T. Hiscock	2,350	275	2,625
E. Toms (accepted)	2,189	247	2,436
J. Dorey	2,200	209	2,409
Piller & Sons*	1,896	163	2,059

* Withdrawn.

WEST WYCOMBE (Bucks).—For alterations and additions to West Wycombe Cottage, Bucks, for Sir Edwin Abercromby Dashwood, Bart. Mr. Arthur Vernon, architect, 26, Great George-street, Westminster, S.W.:—

Silver & Son	£1,755 0 0
Jos. Lacey	1,665 0 0
Grist	1,578 0 0
Gibson	1,500 0 0
Harris	1,475 0 0
Martin	1,467 0 0
Nash	1,439 0 0
Hunt	1,237 0 0
Flint & Maddeford	1,279 0 0
Loosley	1,190 0 0

WOOLWICH.—For alterations and additions to the "Globe" public-house, for Messrs. H. & V. Nicholl, Limited. Mr. Albert L. Guy, architect and surveyor, 78, High-street, Lewisham:—

Proctor	£700 0 0
Pritchard	480 0 0
Jerrard	437 0 0
R. Soper	418 0 0
T. Knight	402 0 0
D. & E. Kennard	394 0 0
Chas. Robson (accepted)	390 0 0

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